the Mecheleciv

VOL. 14 MARCH 1955 NO. 4

SCHOOL OF ENGINEERING
THE GEORGE WASHINGTON UNIVERSITY

Robert L. Land, Jr., Class of '51,
speaks from experience when he says,

U.S. Steel offers thorough training . . . exposes the graduate engineer to many interesting phases of the steel industry

ROBERT L. LAND, JR., graduated with a B.S. in Chemical Engineering in February 1951. He had previously been interviewed by U.S. Steel college recruitment representatives and had been offered a job. He began working in the Coke Plant at the Gary, Indiana Works of U.S. Steel immediately after graduation.

After extensive training and several promotions, Bob was made General Heater Foreman on November 1, 1954. This exceedingly important job makes him responsible for the proper heating and the quality of *all* coke produced at the Gary Works—the second largest coke plant in the world—with 16 batteries of coke ovens producing 15,000 tons daily. He has a crew of 60 and 8 foremen working under him.

Bob feels that U.S. Steel really gets the young graduate engineer off to a good start with a well-planned and complete training program. He says, "U.S. Steel offers the graduate engineer an excellent chance to work in a number of different fields."

This enables the graduate who has not decided on his exact field to look around the big steel industry from within and to find the type of work that suits him best. After a man is given the chance to really find himself and has been adequately trained, "U.S. Steel offers security and an unlimited possibility of advancement providing the engineer shows initiative and the willingness to work."

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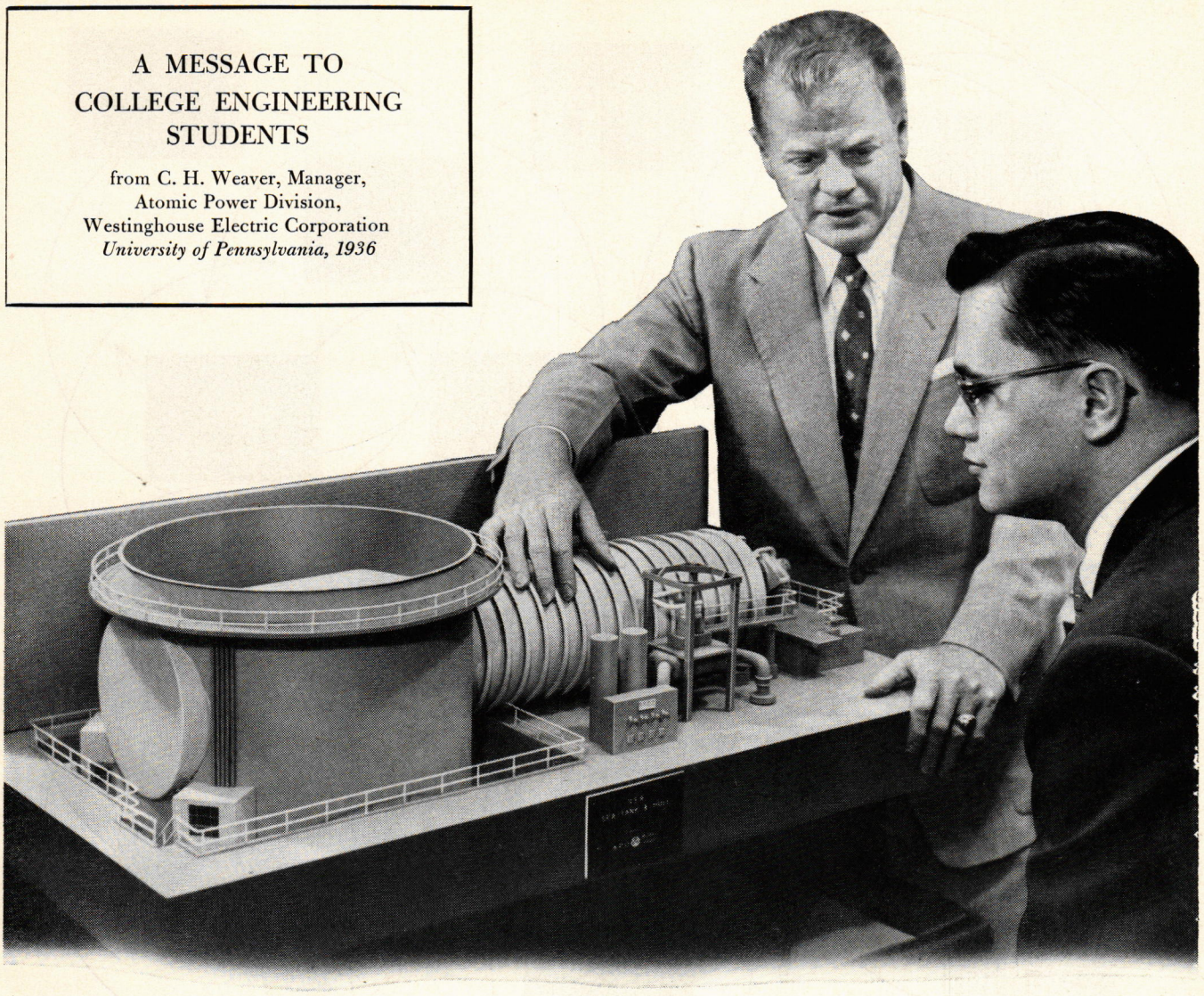
A MESSAGE TO
COLLEGE ENGINEERING
STUDENTS

from C. H. Weaver, Manager,
Atomic Power Division,
Westinghouse Electric Corporation
University of Pennsylvania, 1936



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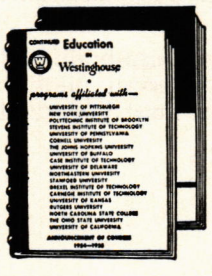

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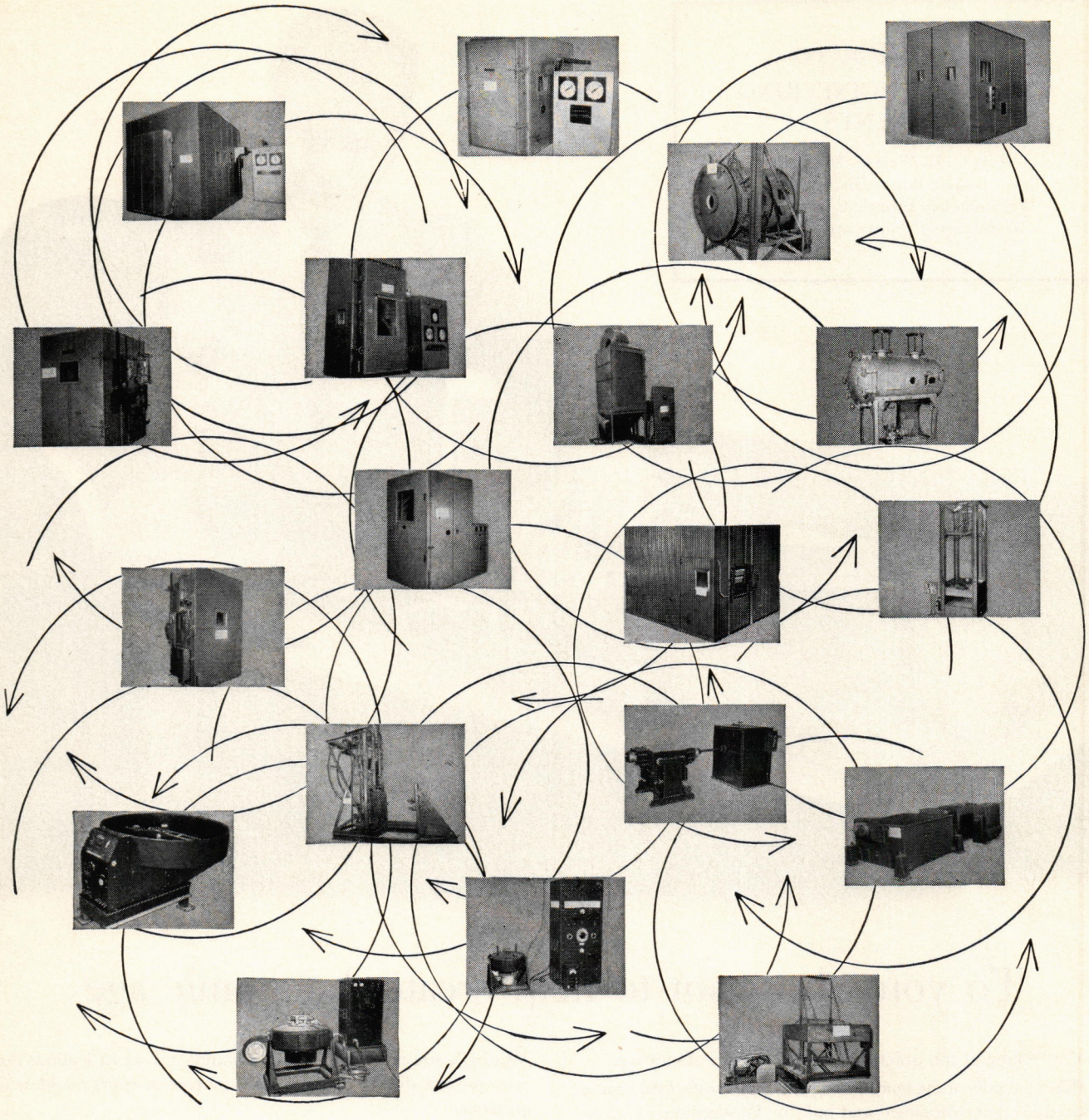

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Today, Martin's facilities are among the finest in the world for design, production and proving in the field of avionics...one of the major developments of Martin Systems Engineering which is now tailoring airpower to previously impossible requirements.

You will hear more about Martin!

MARTIN

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the Mechelecіv

VOL. 14 MARCH 1955 NO. 4

SCHOOL OF ENGINEERING, THE GEORGE WASHINGTON UNIVERSITY

IN THIS ISSUE

ON OUR COVER

Air Force F-86D Sabre Jet interceptors shown in vertical flight over the California coast. The Sabre Jet powered by a General Electric J47-17 turbo-jet engine with afterburner, tops 650 mph to rank as the fastest American interceptor.

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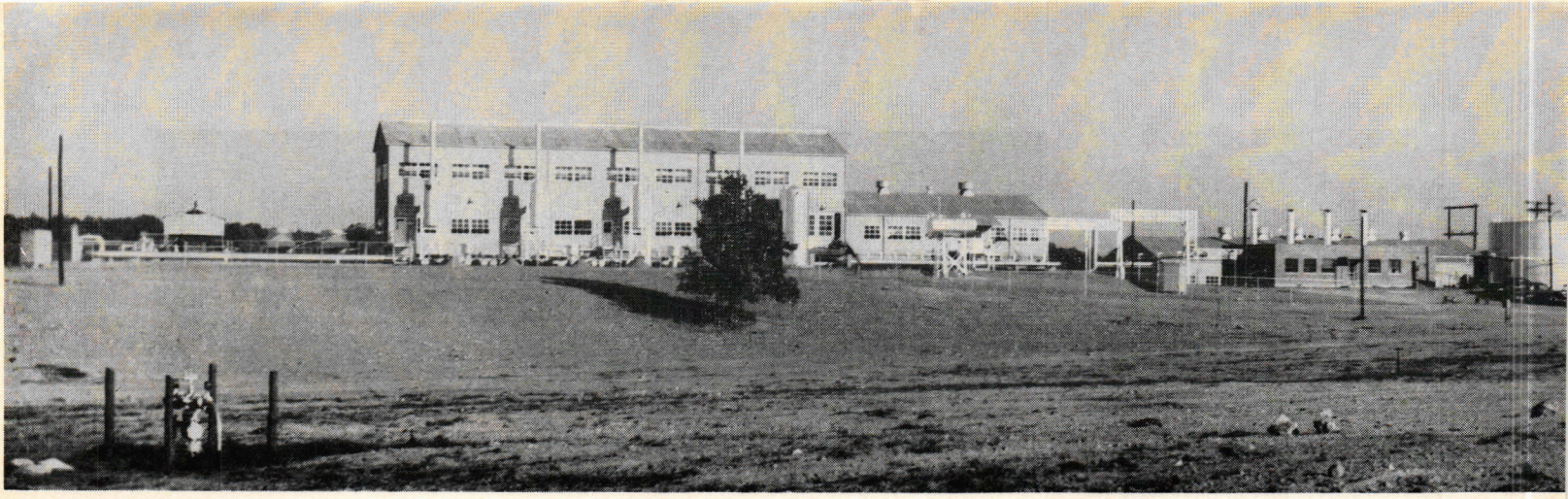

Washington Gas Light Company Rockville Storage Plant

BILLIONS OF BURIED B.T.U.'S

By Ray Sullivan

Ray Sullivan, the latest addition to our staff, is employed as a Technical Representative for the Philco Corporation here in Washington. His extra-curricular claim to fame is that he is one of the first Freshmen Delegates on the Engineers' Council, representing the evening M.E. 1 class. His major is Electrical Engineering and he is serving out his freshman term.

If you happen to be driving out Route 240 just beyond Rockville, Maryland you might notice a herd of cattle grazing on about 125 acres of pleasantly rolling, grassy land. This scene of pastoral serenity may impress you as just another pasture unless you also notice that the surface of the meadow is broken at regular intervals by an outcropping of piping which is obviously out of keeping with the cattle, assuming of course that dairy farming has not reached the stage of mechanization where the milk is piped directly from the source. You might look further and notice that, instead of a barn, one part of the "pasture" contains a group of factory-like buildings. If you were to inquire into the matter, you would find that rather than being simply a farmer's pasture. this tract of land contains enough stored natural gas and natural-gas equivalent to provide the customers of Washington Gas Light Company (WGLC) with gas at a normal rate of consumption in case of an interruption in supply.

Preliminary Considerations

Area residents will recall that WGLC converted to straight natural gas in 1946 and 1947. This natural gas is supplied to WGLC via pipeline under what is known as a "demand commodity" contract. This means that WGLC has to pay for the gas at a rate determined by the volume of gas used on the day of greatest demand during the year. You can readily see where it would literally pay dividends to reduce the drain on the supplier on the days of greatest demand (peak days) or in other words, to "shave" the peaks so as to average out the demand. Since most of the gas sold by WGLC is used to heat private dwellings, the day of greatest demand is also probably one of the coldest days of the year or, as the gas company workers call it, a "peak-shaving" day.

There are also peaks of shorter duration known as "hourly distribution" peaks which vary with the time of day and week. When cooks all over town turn on their gas ranges to prepare meals at approximately the same time, a peak is caused. Another daily peak occurs in the morning when people turn up the thermostat to warm up the houses which have been held at reduced temperatures overnight. There is also a weekly peak for similar reasons when places of business, which haven't been used over the weekend, are warmed up for the week's business.

In order to reduce the risk of a discontinuity in service to customers because of an interruption in supply and also to provide a supply of gas to be used in peak shaving, it is common practice to install a storage plant in the area of distribution from which gas can be drawn when needed. WGLC found that a tract of land within half a mile of the Rockville Metering Station of their supplier, the Atlantic Seaboard Corporation, met their requirements for a site.

After careful consideration of all the factors involved and the various methods of providing standby service, WGLC decided that the best system under the circumstances was a combination of high-pressure natural-gas storage and propane-air production facilities providing a total capacity equivalent to approximately 176 million cu. ft. of natural gas. In case of an emergency such as a break in the supplier's lines, the stored natural gas can be made avail-

able for delivery into the distribution system in a matter of a few minutes. This gives time to prepare for the production of the propane-air gas.

Extensive laboratory tests were conducted to determine the B. T. U. content of the propane-air and the proportions of propane-air and natural gas which would give satisfactory appliance operation. These tests indicated that when four parts of a 1500-B.T.U. per cu. ft. propane-air gas were mixed with about six parts of natural gas, the resulting mixture would be reasonably satisfactory and would have an average B. T. U. content of approximately 1250 B. T. U.'s per cu. ft.

Because the location of the storage plant is somewhat remote from the center of the distribution area, all sendout facilities were designed for a maximum delivery pressure of 250 pounds per square inch (p.s.i.). The proximity of the source of supply of natural gas provides high inlet pressure which is an advantage when compressing natural gas into high-pressure storage. Conversely, the relatively high delivery pressure requirements necessitated the installation of a greater amount of power for compression of air for propane-air production that is generally required for most propane installations.

Rockville Storage Plant

The storage plant at Rockville is comprised of 2,864 natural-gas storage "bottles," 50 liquid propane tanks, compressor house, pump room, boiler house, office and control room, all interconnected by miles of piping.

In brief, operation of the plant is as follows: Natural gas received from the supplier is dried, compressed, and pumped into the storage bottles. Propane is transferred from railroad tank cars directly into the propane tanks. When withdrawn from storage, the high-pressure natural gas is preheated and reduced in pressure, the propane is preheated, vaporized, blended with air, then mixed with the natural gas. This mixture is then discharged into the transmission line for distribution.

Natural-Gas Facilities

The high-pressure, underground method of storing natural gas is relatively new. Most people are more familiar with low-pressure storage methods. GWU engineering students who took Plane Surveying in past years undoubtedly remember the two large "tanks" which stood at the intersection of Virginia and New Hampshire Avenues for many years. The function of these low-pressure storage holders was taken over by the Rockville storage plant and they were dismantled in 1954.

The so-called bottles used at Rockville are seamless steel tubes of a special alloy steel, 24" O.D. with a minimum wall thickness of 0.448," approximately 40 ft. long and have integrally forged heads. These bottles are installed underground with a minimum cover of 3' 6" of earth and in groups of 16 to 45 depending on the shape of the field at the point of installation. The bottles within the groups are spaced 8' end to end and 15' center to center. Those which are end to end are connected by means of one-inch diameter expansion loops. Each group is then connected to a two-inch manifold by means of similar one-inch expansion loops. Valves and pressure gauges for each group are available above ground. Several groups of bottles are connected with each other and are connected to the plant process area by a six-inch field header. All of the piping and bottles are coated, wrapped, and cathodically protected to eliminate corrosion.

The gross storage capacity is approximately 66 million cu. ft. of natural gas of which approximately 62 million cu. ft. is the effective capacity available from storage for the design outlet pressure of the plant.

The natural gas to be stored is dried before being compressed to its ultimate storage pressure of 2240 p.s.i. gauge. The gas drier is a two-chamber unit which operates on a cycle dependent upon the water content of inlet gas and the quantity of gas passed through the drier. The drier utilizes 9,000 lbs. of activated alumina (aluminum oxide) desiccant which reduces the water content of the gas to the required level. The desiccant is re-activated by passing through each chamber 50,000 cu. ft. of gas per hour which has been heated by steam to over 350° F.

The gas is compressed to storage pressure in two stages. It is cooled between stages of compression and after final compression, by two fin-fan air-cooled units. After final compression and cooling, the gas flows through seven field headers to the fields for storage.

When the natural gas is withdrawn from the bottles, it is preheated with steam before its pressure is reduced to about 250 p. s. i. through one or more special control valves. This heating eliminates the possibility of "freezing up" as the result of hydrates forming in the gas and also avoids subjecting the distribution mains to low temperatures.

A by-pass line is provided to enable mixing natural gas from the supplier's pipeline with propane-air gas for distribution.

Propane Facilities

A railroad siding is provided for receiving liquid propane by tank car. Unloading is accomplished by means of natural gas pressure ap-

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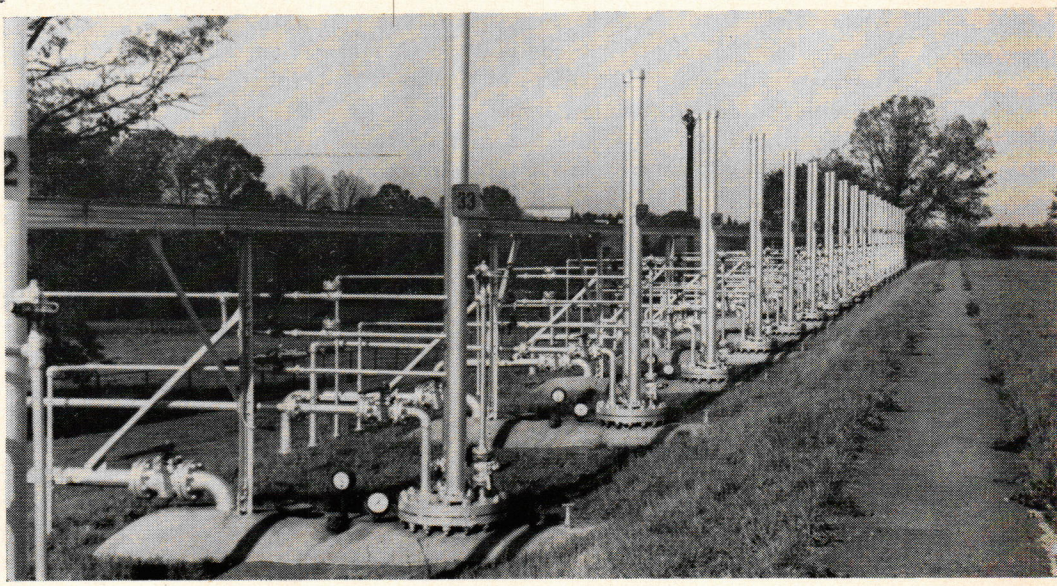


A portion of the propane storage facilities.

. . . For you?

The ultimate University-wide recognition for student activities participants is initiation into Omicron Delta Kappa, national leadership society for men.

Eligibility for membership in O. D. K. is determined by a summation of "activity points," different point values existing for each University activity. Every engineering school activity, it may be noted, is accounted for in the membership requirements.

Under the present set-up it is possible for the engineering student to receive almost all of his forty required activity points in engineering school activities. For example, if his Q.P.I. average is over 3.0 he automatically receives 15 points. If he is in Sigma Tau, he has 5 more points.

Assuming this hypothetical student is on the Engineer's Council, an elected officer of Theta Tau or a society, and is on the MECHELECIV staff, he gains 5 plus 3 plus 3, or 11 more points. This student now has a total of 31 points in the Engineering School alone and needs only nine additional points for membership.

There are two positions in the Engineering School activities that almost insure a student of eligibility into O. D. K., providing he has at least a 2.60 Q.P.I. These positions are President of the Engineers' Council and Editor of the MECHELECIV, since 12 and 17 points are awarded respectively for these positions. Other high point offices are as follows: Associate Editor or Business Manager of the MECHELECIV—12 points, Student Council Representative—7 points plus 7 points for being on the Engineer's Council, Engineering School Editor of the CHERRY TREE—10 points, and President of any society or fraternity—5 points.

The spring semester is the time of the year for student elections, and many times students are undecided just where they should pledge their spare time. Working toward the goal of possible eligibility in O. D. K. is one method of deciding what offices to run for, or in which activities to devote the most time.

Since this goal may be the aim of some of our readers, MECHELECIV has received permission from the G. W. chapter of O. D. K. to print the rules for eligibility in part, as they apply to engineering students.

OMICRON DELTA KAPPA
MEMBERSHIP REQUIREMENTS

Section 1 — General Requirements

1. Junior standing or the equivalent, including transferred credits.
2. Ranking in scholarship in the upper 35 per cent of men in his school of the University. (The cut-off point is arbitrarily set at a Q.P.I. of 2.60.)
3. A minimum total of 40 points from the detailed schedule in Section 2 of this Article.
4. Inclusion among the positions held of any of the following:
   a. One position evaluated at a minimum of 20 points.
   b. One position evaluated at a minimum of 15 points

(Please turn to page 26)

A Voice In The Council

Do you want to have an Engineers' Mixer next year? Do you want the professors evaluated? Do you want coffee served in classes? Do you want the Physics Department abolished?

Not all of these things can be done, although your Engineers' Council can bring about some of these changes—but it is up to you whether they do or not!

This year something different is being tried. Every student will have an opportunity to run for a seat on the Engineers' Council, and every student will have the chance to vote for his favorites. In this way you will have a great deal to say about the policy of the Engineers' Council next year and in the years to come. . . something you haven't had before.

It is up to you. In April the Engineering School General Election for class representatives will be held. This election is separate from the University Student Council elections, and you should vote in both elections.

In order to have an election, however, there must be candidates. Any student, not on probation, and who does not graduate before June, 1956, is eligible to run for the Engineer's Council in the General Election. If he is defeated he also may run again the following month in his Society or Fraternity elections.

All students who wish to run for the Council must petition for candidacy before March 25. They may secure and file the short petition forms in the office of the Secretary of Student Activities, in the Student Union Annex.

The April issue of MECHELECIV will carry a short description of the platforms (or any other information the candidates wish to broadcast) no cost to the contenders. The MECHELECIV will also print a picture of any candidate who desires it for identification, but the representative-to-be must pay for the cut himself. The charge for the picture will be $3.00 for a 2½ x 2¼ halftone.

There will be six Engineering Council delegates elected in the General Election. Two will be freshmen this semester, who will be the Sophomore class representatives on the Council next year; two will be Sophomores to represent the Junior Class next year; and two will be Juniors to represent the Senior Class next year. Obviously, we expect the Sophomore class next year to be made up of students who this year are last semester Freshmen.

The General Election will be held April 20, 21, and 22. Details of voting procedures will appear in the April MECHELECIV and the April 19 issue of the HATCHET.

Campaign rules will be given the candidates when they pick up their petitions.

GRADUATE RECORD EXAMS

WHAT THEY ARE AND HOW THEY AFFECT YOU.

By Dean Martin A. Mason

Something called the Graduate Record Examination came into the life of G. W. engineering students about Thanksgiving time last year, causing some consternation, more discussion, and no end of conversation. No one seems to know what this latest academic "gimmick" is, but there appears to be some feeling that it may be of some value, in some manner, to somebody.

Now here is the story. The University has its educational program under continual study. One important element of the study is some measure of the quality of the graduating students, referred to a reasonably broad and stable standard of comparison. The same kind of quantitative measure of quality is considered by many schools to be valuable in the selection or admission of students to graduate study. As a by-product each individual student finds the same kind of quality measure of personal interest in defining himself relative to a large but unidentified cross-section of people who have supposedly attained the same common level of academic achievement, i.e., a baccalaureate degree. For these, and other reasons less pertinent to a student, the University last Fall began the provision of Graduate Record Examination opportunity to our graduating students on a compulsory basis and—at the expense of the University.

The tests are standardized on a national basis, and are administered by the Educational Testing Service. No one at the University knows what is in the examination—in fact our only connections with the examination are to arrange for it to be given, and to pay its cost. In engineering there are two tests: an Aptitude Test, yielding scores on Verbal Ability and on Quantitative Ability, and requiring three hours for completion; and an Advanced Engineering Test, in two parts of 100 questions, yielding a score indicating achievement in the area of engineering, and requiring three hours for completion. The tests are given, usually, on a single day, but may be given in two days.

The scores obtained enable comparison of the performance of a single individual with that of certain large groups of examinees (essentially a national cross-section). Thus the student may place himself, in terms of test performance, in reference to all students who have taken the same tests. In engineering, for example, scores are compared to a standard of development from the results of tests taken by 472 senior engineering students in 12 engineering schools, including, among others, Antioch College, Buffalo, Lehigh, Georgia, Louisville, South Carolina, and state University of Iowa. Aptitude test scores refer to a norm based on results of tests of 3,035 senior students in some 21 schools. The norms thus established are believed to be reliable nationally, and will become more so as additional testing is conducted. In 1954 tests were given at 193 schools.

What benefits does the examination bring to a student? First, a word of explanation; the test has no influence of any kind on graduation—it is only a record examination. Now, for benefits. Your scores give you a measure of your achievement as compared to other graduating engineers. The test record may make admission to graduate study possible—it may also result in denial to admission. The examination may show up areas of deficient knowledge important to your future professional practice that you may desire to remedy.

Finally there are the great advantages to the school and its future students attached to the knowledge of how well the school is succeeding in achieving its announced purpose. Records of test results are filed with the Registrar. Each student receives from the Registrar a copy of his scores, with a leaflet on interpretation of scores. A confidential record of all scores is furnished to the University. No scores applying to a specific student are released unless authorized; they are part of your confidential record maintained by the school.

How do our graduates compare with others? It is too early to talk with any assurance—the few who have participated were a long way above the bottom and not so far from the top as to cause any distress. If you hear rumors that some of our people rated in the top 10% nationally don't dismiss them as hogwash.

Splash!

THE STORY OF THE G. W. SAILING TEAM

By Bernie Goodrich

Bernie Goodrich is in a good position to know of the Sailing Team's activities, since he is now serving as Commodore of the organization. Bernie is a history major in his sophomore year, attending school part-time and working for the Evening Star. His major extra-curricular interest, besides the Team, is in his social fraternity, Sigma Alpha Epsilon.

This year the George Washington University Sailing Association will mark the tenth anniversary of its founding. Although it is a youngster among campus organizations, it already has made a name for itself in collegiate sailing. Several engineers have played a prominent role in the achievements of the group.

Stated briefly, the sailing club is a group of enthusiasts who enjoy sailing year around—in the heat of summer and in the dead of winter.

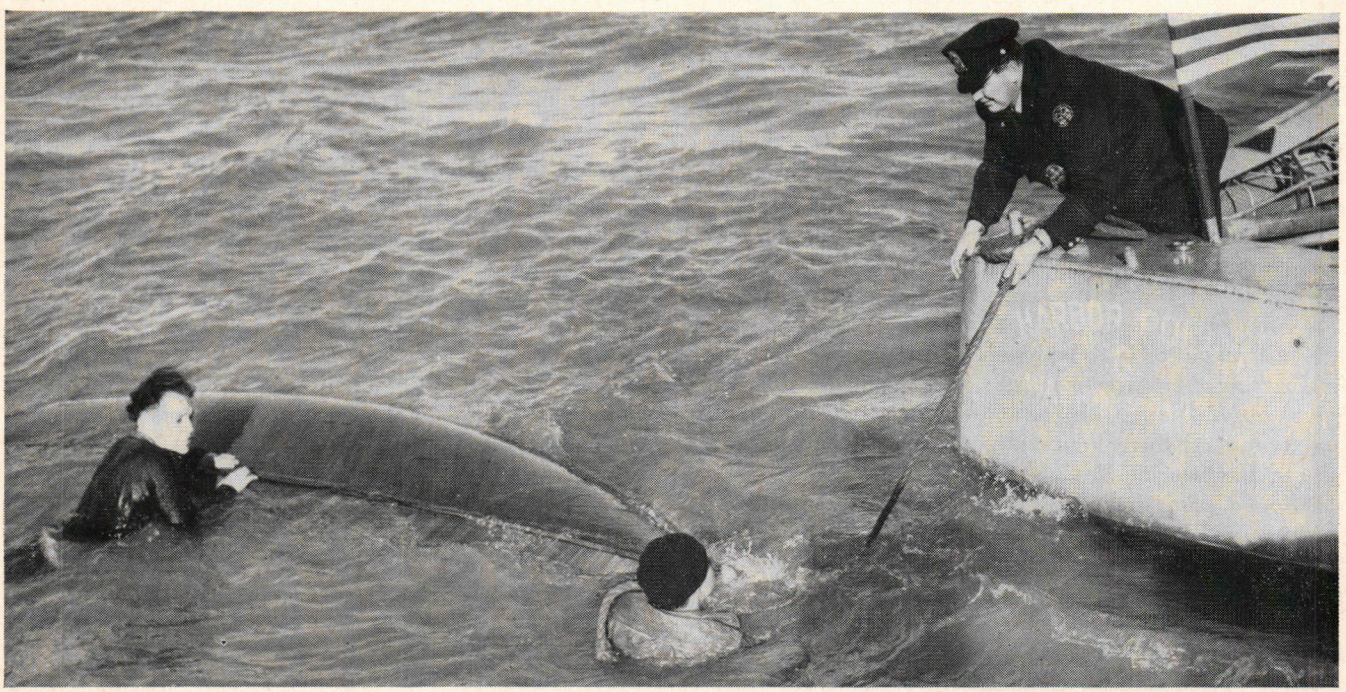
The purpose of the sailing association is to promote better seamanship, greater appreciation of sailing for recreation and sport, to engage in intercollegiate competition and to provide interested students with an opportunity for instruction.

The training program stresses actual sailing experience, and on weekends beginners have an opportunity to sail with experienced hands who demonstrate and explain the intricacies of the sport. Intra-association regattas, in which new members compete against others of similar experience, are held periodically. These races give neophytes a chance to try their hand at skippering alone and at the same time introduce them to competition sailing. Shore classes also are an important part of the training schedule. Following business meetings, held every other Wednesday evening in the Student Union Annex, prospective skippers get filled in on terminology, safety hints and racing tactics.

After completing the thorough training course, new members are given a "checking out" cruise, a procedure similar to a pilot's solo flight, with a senior skipper to determine whether they are capable of handling the boat by themselves under any conditions. If they successfully demonstrate their ability, they become full-fledged skippers and as such are entitled to full use of the university's boats.

Sailing is usually regarded as an expensive hobby and purchase or rental of sailboats can easily run into hundreds of dollars. For sailing club members, however, year-round use of the club's boats is included in the three dollars per semester dues. The association owns and maintains ten Tempest class (dinghy-type hull with a single sail) boats at the Buzzard Point Boatyard, First and V Streets, S. W.

The group is unique among campus organizations because it is the only co-educational sport at the university. Women, Pat Granger and Gene Channey, were among the pioneers of club and their successors have remained prominent in sailing and club activities. During the 1954 spring semester, for instance, all five club offices were held by the fairer sex. Currently, two women rank in the group's top five sailors. Three women, Virginia Raven, Ann Piggot and Barbara Harvey, are regular crew members for the team.



. . . It doesn't happen often, luckily.

One of the University boats negotiating a turn.

Plans to form a sailing club and racing team at the George Washington University first took shape in the fall of 1945. Seven students, Pat Granger, Gene Channey, Bob Grunewell, Arch Harrison, Bill Hastings, Harvey Lakson, and Eric Nordholm, were eager to form an association to represent the school. Most of them had already achieved some note in Penguin class sailing in the Washington area and a few owned their own boats.

In the fall of 1946, the yet-unrecognized club was able to schedule its first regatta at Annapolis with the U. S. Naval Academy. The new team beat the Navy and the club was on its way. That semester they entered the Schell Trophy Regatta at M. I. T. and placed ninth in the finals against 27 of the top teams of the nation. Membership, meanwhile, had risen from 8 to 40 members—many of whom had never sailed. In the spring of 1947, the association sponsored its first home meet, the traditional Beer Mug Regatta, with Princeton University. After making a favorable showing in eight regattas that season, the team conferred with university officials and sailing became an official sport at The George Washington University.

The following semester the sailing association in cooperation with Georgetown and Maryland Universities, held the first Frostbite Regatta, a meet that has become a traditional highlight in the University's sailing season. The home team won the regatta by a slim two points and became the first holder of the Marvin, Gorham, Byrd Trophy, named in honor of the presidents of the three sponsoring schools. M.I.T. was the winner of the 1954 Frostbite event, with Navy in second place and George Washington placing third. Other participants finished in the following order: Georgetown University, Catholic University, Stevens, University of Maryland, Webb and Detroit. The high-point skipper was George Collins of George Washington in "A" Division and Nick Newman of M.I.T. in "B" Division.

The spring of 1948 saw the organization still growing. The first spring racing, the annual Beer Mug Regatta opened with a gust. The meet was called after the first race when eight out of ten boats capsized. The sailors worked all night to get the boats back in shape for the Easter Sunday Regatta the following day, when the team tucked another victory under their belts. This season they also claimed the Associate Membership Championship in the ICYRA and took a close second in the Middle Atlantic States Championship. By this time the membership had grown to nearly 100.

In the semesters following, the sailing association and team continued to expand their activities. In the spring of 1949, the team was invited to the National Championships but were unable to go. For the first time, the Colonial sailors were defeated by a local school in a formal regatta, when Maryland won the 1949 Greater Washington Championships. We took a close second. By the following year, the Buff sailors were acknowledged to be one of the foremost teams in the country. They had won at least once over such formidable opponents as Yale, Boston College, Brown, Cornell, Michigan, Ohio State, Navy and others. They also came home with the Frostbite Trophy for the second time in the three years it had been offered.

In 1951, engineer Bob Harwood led the team to either a first or second place in all seven regattas attended. These successes led them to represent the Middle Atlantic States in the National Intercollegiate Championships at Balboa, California, where they placed third to Yale and California.

Placing fifth in the Nationals in June 1953, skippers John Dodge (another engineer) and Lorenze Schrenk opened the fall season by beating M.I.T., then the nation's third top team. At the Angston Memorial Regatta in Chicago, the Buff team and Harvard were the only eastern teams invited to participate. George Washington placed first leaving second place to Harvard, the favored team.

Again in 1954, Dodge and Schrenk ranked high among American collegiate sailors. They again were invited, and won the Angston Trophy Regatta and represented the school in the Nationals in California.

The Specie Engineer:

AT MINNESOTA

Bobby Holland, a transfer student from the University of New Mexico is a sophomore in the School of Journalism here. She is a member of Kappa Kappa Gamma Sorority and is on both the MECHELECIV and the HATCHET staffs. Her most recent accomplishment was becoming the first co-ed to write for MECHELECIV.

Bob van Sickler has written for MECHELECIV before, including "These Changing Curricula," "The Logistics Computor," "Vibration Control Maierials," and author blurbs such as this one. He is a member of Delta Tau Delta Fraternity, Theta Tau, and Sigma Tau. His most recent accomplishment was pinning his co-author.

What is an engineering student?

An engineering student is: biologically, generally male; physically, healthy; mentally, sane or no more peculiar than the rest of the human race; morally, no better or worse than average; and socially—a nonentity.

Reviewing his qualifications it may be seen that an engineer has all of the socially acceptable attributes. He doesn't chew tobacco, spit, swear, or tell off-color jokes in mixed company. He has only one head, two arms, two legs, and all the internal organs necessary to maintain life. That he is predominantly masculine, is the most impressive factor in his favor—a boon indeed to the young lasses attending our institutions of higher learning in search of matrimony and those who have already found it. Why then is an engineering student with all the qualifications for social success often considered an oddity—a man apart —dedicated to his books and occasional trips to the local pub?

The answer lies in part, if not in whole, to the lack of extracurricular activities in which the average engineering student participates. The curriculum of an engineering school is extremely rigid. The majority of his courses are technical and do not provide a proper basis for the understanding of the world or the people around him. The engineer unfortunately, also, must spend a great deal of time studying—some engineers even claim they must spend more time than a student in a liberal arts course. Be that as it may and all arguments aside—the engineer, although hardly to be considered a bookworm, during the course of his college career withdraws into his briefcase and snaps it shut. No glimmer of light from the outer world seems to penetrate his universe of slide rules and handbooks.

The same black picture of the engineer on the campuses of the Universities of the U. S. was painted by a professor of English at an engineering school in a pamphlet entitled "Why extracurricular activities for engineering students?"

The co-authors of this series of articles are not taking issue with him nor are they siding with him. This series is dedicated to the pure scientific research into the engineering activities of a few colleges and Universities with the hope of a free beer or two on the side. The question they would like to answer is "Are engineering students the same on all campuses?" They have not as yet the slightest idea of the answer to their query and they do not intend to try to answer it for you. They will simply tell something of the life on each campus they have visited and let you draw your own conclusions.

The I. T. Student

The University of Minnesota, like many other state institutions, is located in three different cities—Minneapolis, St. Paul, and Duluth. The main campus, containing the Institute of Technology, or, more familiarly, the School of Engineering, is in Minneapolis, 1600 miles from the District of Columbia.

There the engineering student, whether he be an ME, CE, EE, ChE, AerE, AgE, or MinE, acts just like any other engineering student in America. He carries a briefcase; a slide rule is on his belt; he wears an old T-shirt; and a haggard look hides behind his two-day beard. His curriculum is different, since he has a five year course to look forward to on the quarter system, with one year spent in the humanities.

The engineering students at the IT comprise about one-sixth of the total University enrollment—3,000 out of 18,000. They maintain their autonomy by participating in one of the four profesional fraternities, Theta Tau, Alpha Chi Sigma, Kappa Eta Kappa, and Triangle. Many people will remember that Theta Tau was founded at Minnesota some fifty years ago.

Although few of the students in the IT are members of the thirty or more social fraternities on the

Part of the U. of M. campus showing the Zoology building (foreground), the Coffman Union (center, left), one of the footbridges over Washington Ave., the Mississippi River, and downtown Minneapolis.

campus, professional societies thrive. There are student branches of the American Society of Agricultural Engineers, the ASCE, The American Institute of Chemical Engineers, The Society for the Advancement of Management, The American Institute of Architects, The American Chemical Society, the ASME, The American Institute of Mining Engineers, and the AIEE.

There are two big days for the IT students each year—Engineers' Day, complete with the Queen Coleen and the night of the Black Book Dance. The Agricultural Engineers have another date which they celebrate—Kitchi Geshig, which is Indian for "Big Day." This is a big day just for the Ag students, because nobody else ever knows about it.

The specie, engineer, enjoys his spare time just the same as the other students of the University. He goes on Pow-wows near Lost River. (Nobody has ever found the river, but at that time of night who wants to look for it.) He eats schmores—sandwiches of Graham crackers, toasted marshmellows, and milk chocolate—and drinks Stite, a strong beer.

He stands in long lines in front of Memorial Stadium signing his activity card and buys an eyeshade so he can be ushered in by one of hundreds of little Boy Scouts to see Paul Giel and the Gophers win a football game.

He goes downtown to Vic's to hear jump music, or sees exotic dances at the Flame or the Parisian Palms, or he goes to the only tavern allowed within five miles of the University—"Sturbs."

He looks down upon the omnipotent Student Activities Bureau, better known as the S .A. B. or the "Gestapo."

The IT, monthly magazine, the MINNESOTA TECHNOLOG, now one of the better magazines in the Engineering College Magazines, Associated, has had a most interesting history. A few years ago the TECHNOLOG bought out a struggling humor magazine on the campus and immediately proceeded to go into the humor field. They succeeded quite well, and before long the magazine was sought after by just about every student in the University. Now the Administration didn't mind the engineers reading this literature, because they realized that nothing could be done with them, being what they were. But when the sweet young co-eds were beginning to get copies through the black market. . . The humor business was ended.

The uninformed visitor to the U. of M. campus might easily get the wrong impression of what business the University is in, for in almost half of the buildings, it seems, there is a branch of the bookstore. Not only that, there is a bookstore in the gigantic Coffman Union, and two more in Dinky-town, just outside the campus gates. This author has reached the conclusion that the U. of M. students read a great deal. They also must enjoy singing, for one of the bookstores' best sellers is a pamphlet sold under the counter which contains what are described as fifty-two infamous songs.

The parking problem at the University has become serious. Some alleviation has been provided by the opening of three underground lots at 50c an hour. Lots on campus cost 25c an hour and lots off of campus are 20c a day. Between the parking lots and a University tradition of paving student shortcuts across lawns, the once green lawns have given way to what is now called "the concrete campus."

The University itself, besides being well known for its contribution to the processing of Taconite, its library, and its excellent educational facilities, maintains an extensive program of sponsored research. The fields for their programs include aerodynamics, housing and building materials, city planning, farm power and machinery, cosmic rays, hydraulics, mining and metallurgy. In addition, this is one of the few schools that offers a degree in Mortuary Science.

Whether it be in knee-deep snow —when the footbridges over Washington Avenue get even more slippery, or in the spring when the land of ski-u-mah—sky-blue waters—is in its full glory, University life at Minnesota continues. This is our exhibit A to show engineering life at a big ten school.

A fast new color film for miniature cameras has been produced by Eastman Kodak. Known as Ektachrome, the new film is suitable for mounting and projection as color slides and, in addition, can be processed by the photographer or his commercial processor.

* * *

A two million dollar color TV center will be built this year in Schenectady, N. Y. by General Electric. The center, first of its kind in the nation is expected to be put into operation by mid-1956.

JOBS JOBS JOBS

By Casey Mohl

Casey Mohl, one of our veteran MECHELECIV writers again pops up with a timely article. Besides "making the rounds" of senior class job interviews, Casey is an active participant in Theta Tau, Sigma Tau, the Engineers' Council, and A.S.M.E. Last spring at the Engineers' Ball and Banquet he received an award for being the year's outstanding member of the A. S. M. E. On the MECHELECIV staff Casey has held the positions of Feature Editor and Associate Editor.

The life of an engineering student with his many labs, rugged subjects, tedious problems, and minute social activity is seldom envied by students accustomed to less strenuous majors. However, when the final semester rolls around, the engineer is no longer an object for pity. In fact, he is so acclaimed and sought after by representatives of government and industry seeking to employ him that he is liable to develop illusions of grandeur and self-importance.

Up to now, the most attractive offers have come from private industry with the average offer for a graduate engineer with no experience in the neighborhood of $4,500 per annum. All companies seem very willing to hire students who will shortly be called for active military service. However, some companies scale up their basic starting salary for students who have completed their service requirements.

Besides the salary inducements, interviewers offer such fringe benefits as moving allowances, training programs, and financial help in obtaining graduate degrees. In addition, the interviewers usually stress the advancement opportunities and security to be found in their organizations. Extra attractions such as country living, fine fishing, and winter sports are extolled in the expensive brochures that are handed out.

One interesting feature of the interviews is that the company representatives often offer the prospective employee an all expense paid trip to the organization's home plant. Some of the June graduating class have already enjoyed these trips and the opportunity to find out first hand about potential jobs. Unfortunately, the general shortage of time, experienced by engineering students of all levels, still exists for seniors, and this serves to limit the number of such excursions.

Generally speaking, representatives from government agencies have fared poorly in their negotiations with the graduating students as they can only offer a G.S. 5 classification ($3,410 per annum). However. it is believed that government agencies will be authorized to offer higher starting salaries in the near future. One set of figures hopefully quoted is $4,160 entrance with automatic advancement to $4.705 after six months.

If the government agencies were able to offer this more realistic starting salary with their excellent fringe attractions, such as leave and retirement, many students now leaning toward private industry would probably shift to government.

(Please turn to page 28)

INTERVIEW SCHEDULE — MARCH - APRIL

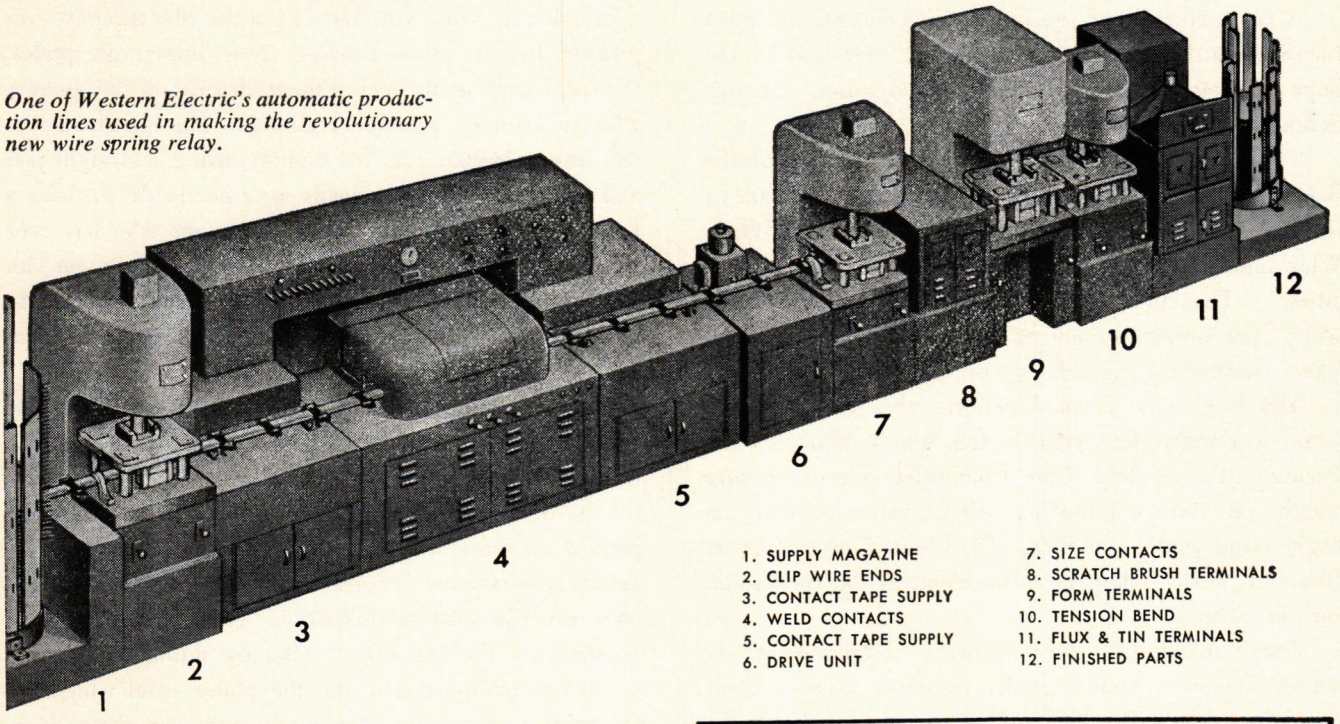
These companies will be holding interviews this month at GW. Interested students should contact the Student Placement Office some time between now and the scheduled date to make an appointment and to pick up the company literature and application form. Interviews are normally held in the morning on the fourth floor of the Library and last approximately a half an hour.

March 8: Vitro—EE, ME, CE., Technical; March 9: Bethlehem Steel—EE, ME, CE, Technical; C & P: Western Electric: Bell Labs—Group Meeting, 4 p.m.; March 10: C & P: Western Electric: Bell Labs—EE, ME, CE, Technical; March 11: Allis-Chalmers—EE, ME, CE, Technical; March 14: General Electric—EE, ME, CE, Technical; March 15: Remington Rand—EE, ME, CE, Technical; March 16: Naval Air Material Center—EE, ME, CE, Technical; Firestone—EE, ME, CE, Sales; March 17: Melpar—EE, ME, CE, Technical; North American Aviation—EE, ME, CE, Technical; Westinghouse—EE, ME, CE, Technical; March 18: Engineering Research Corp.—EE; March 21: Factory Mutual—Engineering Division-Tech.; March 22: Crown Central—EE ,ME, CE, Sales: March 24: IBM—EE, ME, CE, Tech. and Sales; March 25: Western Union—EE, ME, CE, Technical; California Jet Propulsion Lab—EE, ME, CE, Technical; March 28: McDonnell Aircraft—EE, ME, CE, Technical; March 30: Pepco; April 5: Aberdeen Proving Ground—EE, ME, CE, Technical; April 6: Sikorsky—EE, ME, CE, Technical.

AUTOMATION at work

How a revolutionary new design was translated into a production reality

One of Western Electric's automatic production lines used in making the revolutionary new wire spring relay.



1. SUPPLY MAGAZINE
2. CLIP WIRE ENDS
3. CONTACT TAPE SUPPLY
4. WELD CONTACTS
5. CONTACT TAPE SUPPLY
6. DRIVE UNIT
7. SIZE CONTACTS
8. SCRATCH BRUSH TERMINALS
9. FORM TERMINALS
10. TENSION BEND
11. FLUX & TIN TERMINALS
12. FINISHED PARTS

So great was the departure in design of the new Bell System wire spring relay as compared with conventional relays that it posed a major undertaking for development engineers at Western Electric, the manufacturing and supply unit of the Bell System. Indeed, it was an undertaking that called for new machines and new methods because none was available to do the job.

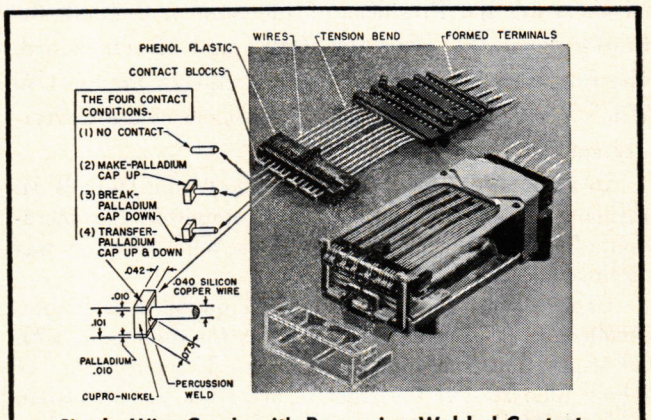
Longer life, higher operating speed, lower power consumption, and lower manufacturing cost were some of the advantages promised by the new relay design. Engineers reasoned that a lower manufacturing cost could be achieved through greater precision in manufacture (which would cut adjustments) and through extensive use of automatic processes.

One of the products of this reasoning is pictured at the top of this page. This battery of equipment, developed by Western Electric product engineers, constitutes one phase of wire spring relay manufacture, which automatically performs several separate operations. Its function begins after one of the fundamental elements of the new relay has been fabricated. This element, known as a "comb," consists of a multiplicity of small diameter wires in parallel array imbedded for part of their length in molded phenol plastic.

These molded elements, of which there are two types used in the new relay, are delivered to this line of machine units in magazines. By fully automatic means they are removed from the magazine, carried by a reciprocating conveyor through each of the several processes and, when completed, placed into another magazine to await further assembly.

Between the first and final magazine the automatic battery of equipment does the following operations: clips wire ends, attaches palladium contacts to wire ends by means of percussion welding, sizes contacts, forms terminal, tension bends wires, fluxes and tins terminals.

Most remarkable of all is the fact that this is a *precision* operation throughout. For example, the small block contacts, which are percussion welded to the tips of wires of one type of "comb," must be located on the same plane across the twelve contact positions to within a tolerance of ± .002".



Single Wire Comb with Percussion Welded Contacts, Wire Spring Relay Designed by Bell Telephone Laboratories

One type of "comb" element is shown at top while a completed wire spring relay is below. The small blocks of metal on the ends of the wires are cut from a composite tape during the automatic multiple percussion welding operation. "Contact conditions" are determined by the code of relay being manufactured and may vary greatly.

Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM

Manufacturing plants in Chicago, Ill.; Kearny, N. J.; Baltimore, Md.; Indianapolis, Ind.; Allentown and Laureldale, Pa.; Burlington, Greensboro and Winston-Salem, N. C.; Buffalo, N. Y.; Haverhill and Lawrence, Mass.; Lincoln, Neb.; St. Paul and Duluth, Minn. Distributing Centers in 29 cities and Installation headquarters in 15 cities. Company headquarters, 195 Broadway, New York City.

THE ENGINEERS TALK BACK

A representative of the Engineering School will meet the Student Life Committee Tuesday, March 8 in the hope of getting more University recognition for our School activities.

This meeting, first of its kind in the history of the School, stems from some dissension raised as a result of the Committee's choices of electees for the recent "Who's Who among Students in American Colleges and Universities." The students chosen for the honor this year were predominantly non-engineer, although several likely engineering candidates were overlooked.

The Engineers' Council believes that the engineers were overlooked this year in the Who's Who election because the Student Life Committee places greater weight on none engineering school activities than on engineering school activities. The Council has appointed Bob van Sickler, their Vice President, as the spokesman for the School.

The Student Life Committee is composed of six student members and 5 faculty members. The student members are the President of the Student Council, the Presidents of IFC, Pan Hel, ODK, and Mortar Board. The Committee, besides making the choices for the GW Who's Who, serves as the judicial branch of the University student government.

In an interview between MECHELECIV and Dean B .H. Jarman, Faculty Chairman of the Committee, the operation of the Committee in the Who's Who selection was outlined as follows:

George Washington is allotted a quota, based upon enrollment, of from 29 to 31 students for the honor, with the stipulation that they be seniors. The publishers of Who's Who reserve the right to make the final decision.

In the fall semester senior students are requested to turn in applications listing their activities. The student members of the Committee then check all petitions for accuracy and submit their recommendations to the faculty part of the Committee.

The faculty members then review the student recommendations and make their decision. Dean Jarman pointed out that the faculty has never accepted the student recommendations in toto.

In making their decisions the Committee follows these tenets: Departmental activities, such as engineering school organizations are always given less weight than All-University activities. There is never any quota of selections by departments or schools in the University. There is never any quota of male vs. female students. Membership in ODK, Phi Beta Kappa, or Mortar Board is heavily weighted, as is membership in the Student Council. Membership alone in other activities counts very little, since prime consideration is given to officers.

Dean Jarman expressed the hope that in succeeding years the Committee will be more informed of the participants in the Engineering School. He arranged for the meeting this Tuesday between the Engineering School and the Committee and he suggested that a similar meeting be held next fall. He also hoped the Engineers' Council would submit its recommendations next year for its own Who's Who candidates.

The MECHELECIV feels that this meeting will be the first step in our School's receiving much delayed University recognition for its activities.

WERE YOU HERE?

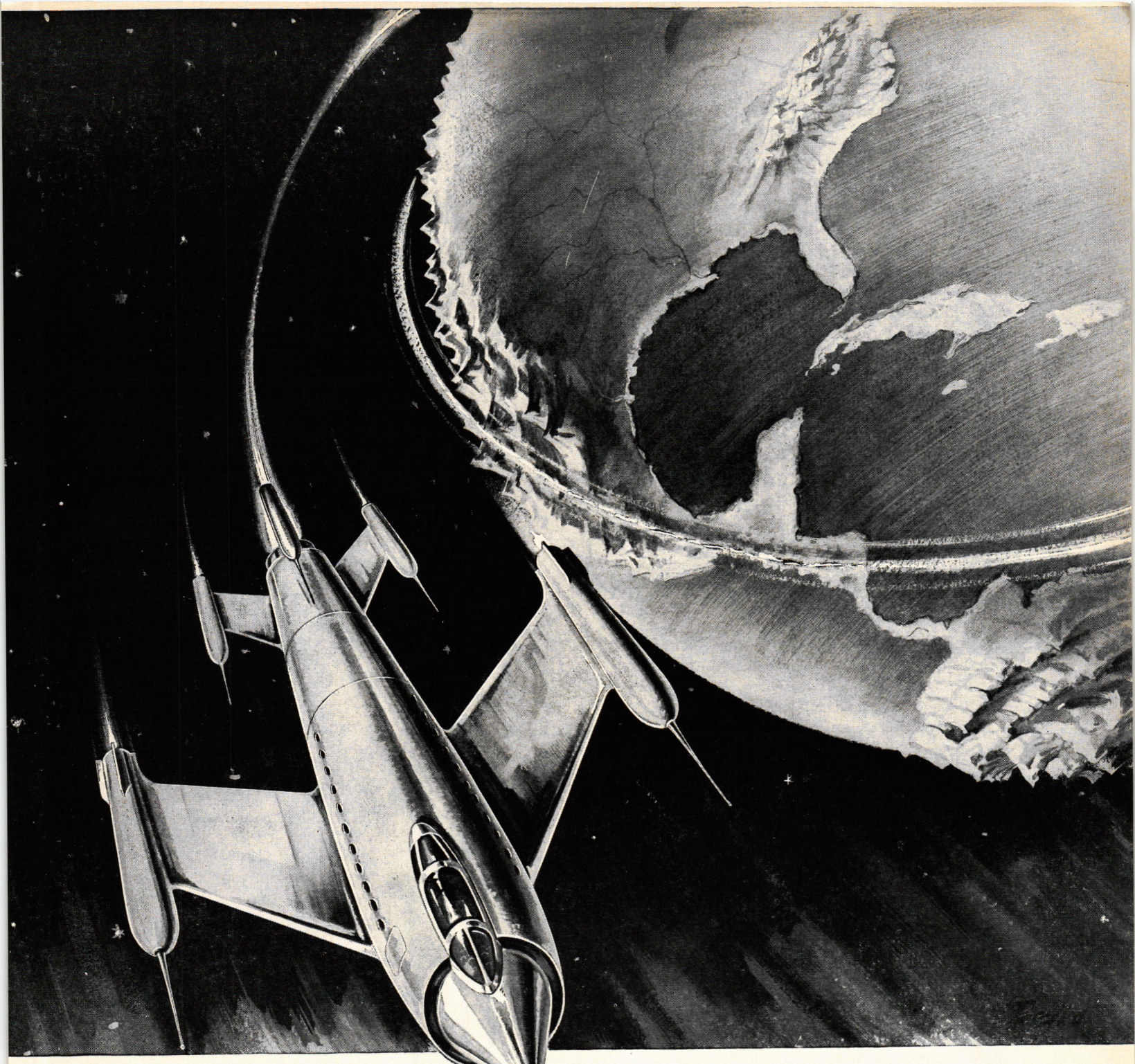
Beginning with Vol. III, No. 8 the MECHELECIV was printed by an offset process from lithograph plates. Columns were set by typing them directly on the dummy with an ordinary typewriter ribbon. The masthead was still drawn freehand on the dummy, using a straight pen and india ink. Column leads were neatly drawn with a Leroy set, also using india ink. Anyone who has ever tried to uniformly space lettering with a Leroy set can appreciate the problems of the make-up man, whose duty it was to put the leads on the columns. The use of india ink permitted no mistakes.

Another milestone of progress in this issue was the appearance of photographs. The photos were trimmed to the correct size and were pasted in their proper places on the dummy. One of the local enterprises which depended on the students of the George Washington University professional schools for their clientele, placed a paid advertisement in this issue. The magazine was in business for the first time. After the dummy was made up it was photographed and the plates from which the magazine was printed were made from the photograph. The improvement in the printing process greatly improved the appearance of the magazine.

The editorial office of the magazine was located at 620 23rd Street, N. W. at this time and, from the rapidity with which the office was moved around in its infancy, one would be correct in suspecting that an elaborate office with a large amount of equipment was not maintained. Since this address is a private residence, it appears that the office was in the editor's home and a change of editors also caused a change of office address.

In the fall of 1944, the allies were rolling back the axis powers and the outcome of the war become more optimistic. The engineers were discussing their post-war plans and were concerned about their futures and the possible lessening in the demand for their services in later years.

The engineering school administration had no fear concerning the future of the profession and plans for a graduate school were in the "talking stage." Professor Walther discussed the possibilities for a graduate school in the MECHELECIV, and although this ambition was not realized until later, time shows that the plan was sound.



Atomic Globe Circling

. . . will become a reality during your engineering career.

When that day comes, you may be certain our engineers will have played a major role in developing the nuclear engines that will make such flights possible.

Solving tough problems like this has made Pratt & Whitney Aircraft the world's foremost designer and builder of aircraft engines. This is the reason why it is first-choice of so many forward-looking technical graduates.

PRATT & WHITNEY AIRCRAFT

DIVISION OF UNITED AIRCRAFT CORPORATION

EAST HARTFORD 8, CONNECTICUT

FIRST YOU DIDN'T . . . NOW YOU DO

In line with the current MECHELECIV policy of continuous improvement and experimentation, a new approach has been made to the circulation problem, one which we hope will win the readers' approval.

Up until this issue all of the mailing and addressing for the magazine has been handled by a private firm that did not do a very thorough job. Difficulty was experienced due to the fact that our circulation manager could not find out just who was getting the issues and who was not.

Over the Christmas holidays the circulation department checked through half of the student copies and found approximately two hundred errors. It was then we decided to do something about it.

For this issue and in the future, through an arrangement with the University, the addressing will be done by the Alumni Relations Department and the MECHELECIV staff. Addresses are taken from the Spring semester registration cards on file in the Dean's office for the student copies and from the Alumni files for the alumni copies.

This new system means much more work for the MECHELECIV staff, so we ask that you cooperate with us. Please notify this office of any change of address. Any students who wish to work in our enlarged circulation department are encouraged to contact us.

FREE TUTORING

The Sigma Tau counselling service has always been considered by many people to be an excellent idea. It has largely failed in the past, however, because the people who need help have not bothered to contact Sigma Tau.

This semester, things will be different. With the permission of the Faculty, those Engineering Students who went on probation last semester will be contacted by a member of Sigma Tau who can give them the necessary assistance. As often as it possible, Sigma Tau will assign a member with the same major field of study as the person on probation. In addition, Sigma Tau has on file a list of members and those subjects in which they feel most qualified to give special assistance.

This service is something that Sigma Tau wants to provide, and is not one that it has to do. The Sigma Tau men will receive no individual credit for their work. Those men who have gone on probation are asked to give their cooperation; after all, they are the ones who will receive the benefit.

BILLIONS OF BURIED B.T.U.'s

(Continued from page 5)

plied to the tank car. This creates a pressure differential between the tank car and the storage tanks which forces the liquid propane out of the tank car and into the storage tanks.

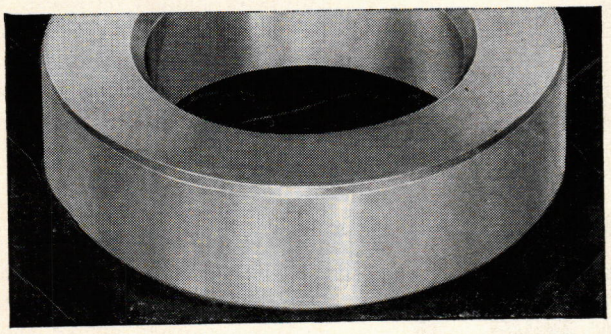
There are 50 coated, wrapped, and cathodically protected steel propane storage tanks at the plant, all are earth covered. These tanks are 8' 10" O.D. by 67' long, with a wall thickness of approximately 1" and are designed for an operating pressure of 250 p. s. i. The net storage capacity is approximately 1,360,000 gallons, the recoverable equivalent to approximately 114 million cu. ft. of natural gas.

Special outlet valves which are operated by a hydro-pneumatic system will close automatically in the event of fire around any of the tank connections, propane pumps, or metering equipment. The valves also

(Please turn to page 22)

Another page for **YOUR STEEL NOTEBOOK**

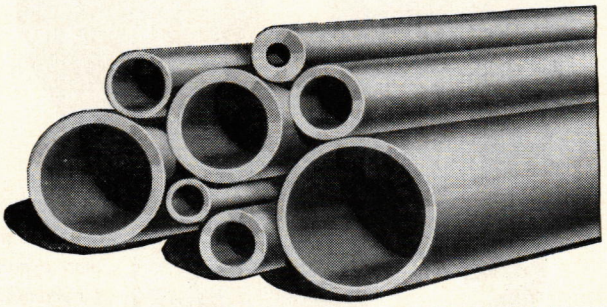
How to make a boring job go faster



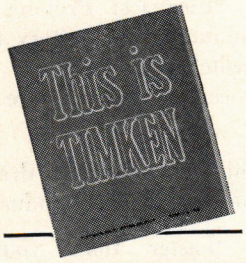
With teeth cut into it, this gear blank becomes an engine part. One manufacturer thought these blanks were costing him too much to make. The center hole had to be bored out of solid bar stock. It took one hour to make 29 blanks. A lot of steel was wasted in the process. He took his problem to Timken Company metallurgists. After study, they recommended a change in production methods together with the use of Timken® seamless steel tubing.

How TIMKEN® seamless tubing helped quadruple production

Because the hole's already there in Timken seamless tubing, it doesn't have to be bored out. *No* steel is wasted. Finish boring is now the manufacturer's first step. He can turn out 120 to 130 gear blanks per hour with a 50% cut in machining costs. This is another one of the hundreds of problems that have been solved by Timken fine alloy steel.

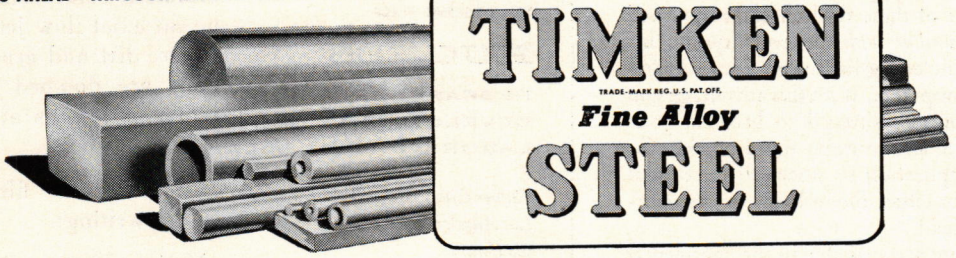


Want to learn more about steel or job opportunities?



Some of the engineering problems you'll face after graduation will involve steel applications. For help in learning more about steel, write for your free copy of "The Story of Timken Alloy Steel Quality". And for more information about the excellent job opportunities at the Timken Company, send for a copy of "This Is Timken". Address: The Timken Roller Bearing Company, Canton 6, Ohio.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH



TIMKEN
TRADE-MARK REG. U.S. PAT. OFF.
Fine Alloy
STEEL

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING

FILMS FOR SOCIETIES

Beginning this issue recent motion pictures available free of charge to organizations on campus will be listed. Further information may be obtained from the MECHELECIV office.

"The Story of Light"—A ten-minute Technicolor sound film illustrating the interesting story of man's efforts to combat darkness. Offered by General Electric, Schenectady 5, N. Y., this film has used a new and intriguing stop-motion puppet technique. The film will be shown in theaters and is also available to organizations.

"Waiting Harvest"—A twenty-three minute color sound film shows the conversion of waste products from coke oven smoke into basic chemicals. The film may be booked by writing to the Motion Picture and Visual Aids Section, Advertising Division, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

Westinghouse has available the following Sound films:

"Advantages of AC Welding"—19 minutes, color—demonstration of the use of ac welding in industry today.

"The Banshee"—17 minutes, color—the story of jet propulsion and speed exemplified by the "Banshee"—the noiseless plane.

"Electrical Proving Ground"—26 minutes, color—story of 25 years of switch-gear testing. Some very spectacular scenes are presented.

"Energy is our Business"—28 minutes, color—a dramatized story of the electrical industry.

"Faster than you Think"—17 minutes, color—showing tests made on an axial flow jet engine. Chunks of ice, dirt and gravel, and nuts and bolts are dumped into the engine's intake as it runs at maximum thrust on a test block.

Westinghouse films may be booked by writing:

Motion Picture Department
Westinghouse Electric Corporation
3 Gateway Center
Pittsburgh 30, Pennsylvania

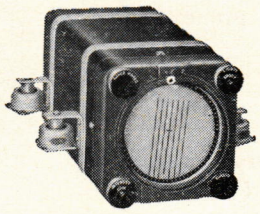
New RCA Radar "Weather Eye" Sees Through Storms

In our time, Man has won round after round in a contest against the elements that started thousands of years ago.

The most recent scientific victory is something new in Radar—an electronic "Weather Eye" developed by RCA.

In airplanes, this supersensitive instrument peers miles ahead. It gives advance warning of weather disturbances. The signals on its radar screen point the way to a safe course *around* storm areas, or even *through* them.

The leadership in electronic research that made the "Weather Eye" possible is inherent in all RCA products and services. And at the David Sarnoff Research Center of RCA, Princeton, N. J., scientists are continually at work to extend the frontiers of "Electronics for Living."



New RCA Weather Mapping Radar weighs under 125 pounds, takes little space in a plane.

For information regarding design and development engineering positions on such projects as "Weather Eye" Radar and military electronic equipment—write to Mr. Robert Haklisch, Manager College Relations, Radio Corporation of America, Camden 2, N. J.

RCA®

RADIO CORPORATION OF AMERICA

ELECTRONICS FOR LIVING

OUT OF THE BRIEF CASE

ON CAMPUS

Derrill Rholfs has been elected President of Xi Chapter of Sigma Tau. He will serve for the remainder of this semester. He replaced Al Parks who graduated in February.

* * *

Theta Tau pledged twelve men at a ceremony in Lisner Auditorium on Wednesday, February 9. They will be initiated March 12 and then attend a banquet and ball in their honor at the Occidental Restaurant that night.

* * *

The February meeting of the ASCE chapter was held on February 2 at the Georgetown home of Professor and Mrs. C. H. Walther. The annual Stag party was the order of the day and it provided an opportunity for prospective as well as past members to meet again after the holidays.

* * *

Anne Chason, who will be long remembered in the School of Engineering as the friendly secretary of the Dean, has just announced the birth of an engineer-to-be, Craig Edward Chason. The statistics as of January 30, Craig's 0 birthday, gave a weight of 9 pounds. The proud papa is Aubrey Chason.

* * *

The American Welding Society is again offering the A. F. Davis Undergraduate Welding award which has a first prize of $200 and a second prize of $150. Prizes are awarded for the best articles on the subject of welding that appear in engineering student magazines this year. GW students who wish to enter should submit their articles to MECHELECIV. Further information may be obtained from the MECHELECIV office.

IN INDUSTRY

A new low-cost photosensitive paper known as Electrofax which requires no chemical processing has been developed by RCA. It is regarded as a practical and inexpensive method of producing master copies of letters, diagrams, microfilm records and other documents. Finished copies can be produced in a fraction of a minute, from exposure to development of the print, using hte new paper.

* * *

One of the five experimental atomic reactors for generating economical electric power in the U. S. from atomic energy is being built by North American Aviation's Missle and Control Equipment organization and the AEC. The sodium-graphite reactor is planned to produce 20,000 KW of heat.

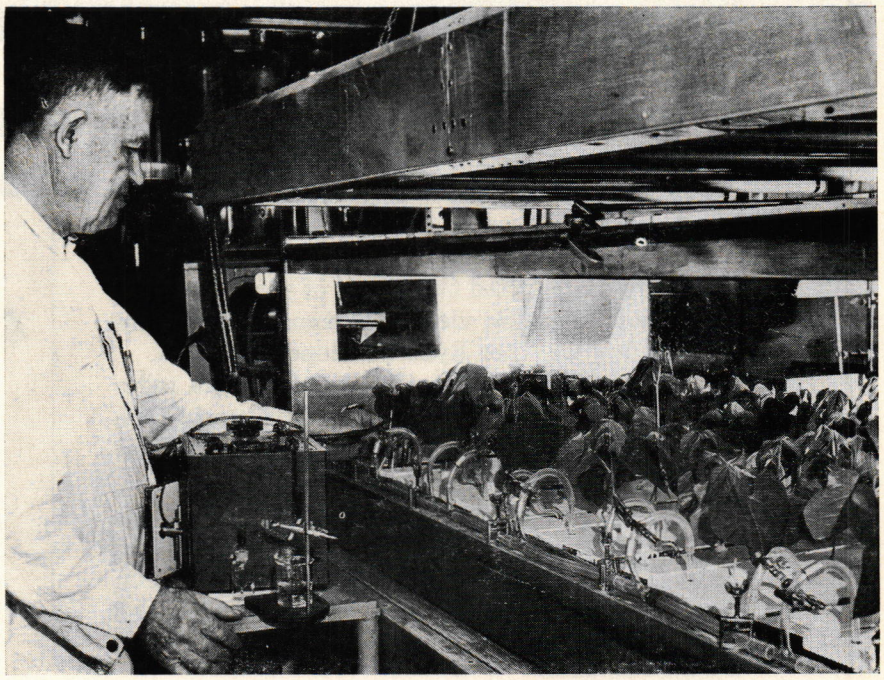
General Electric's "Corporate Alumnus" plan went into effect January 1. This is the plan by which the company will match any gifts given to a university by a GE employee. Although this plan is still unique to GE, it is being considered by other corporations for their employees.

* * *

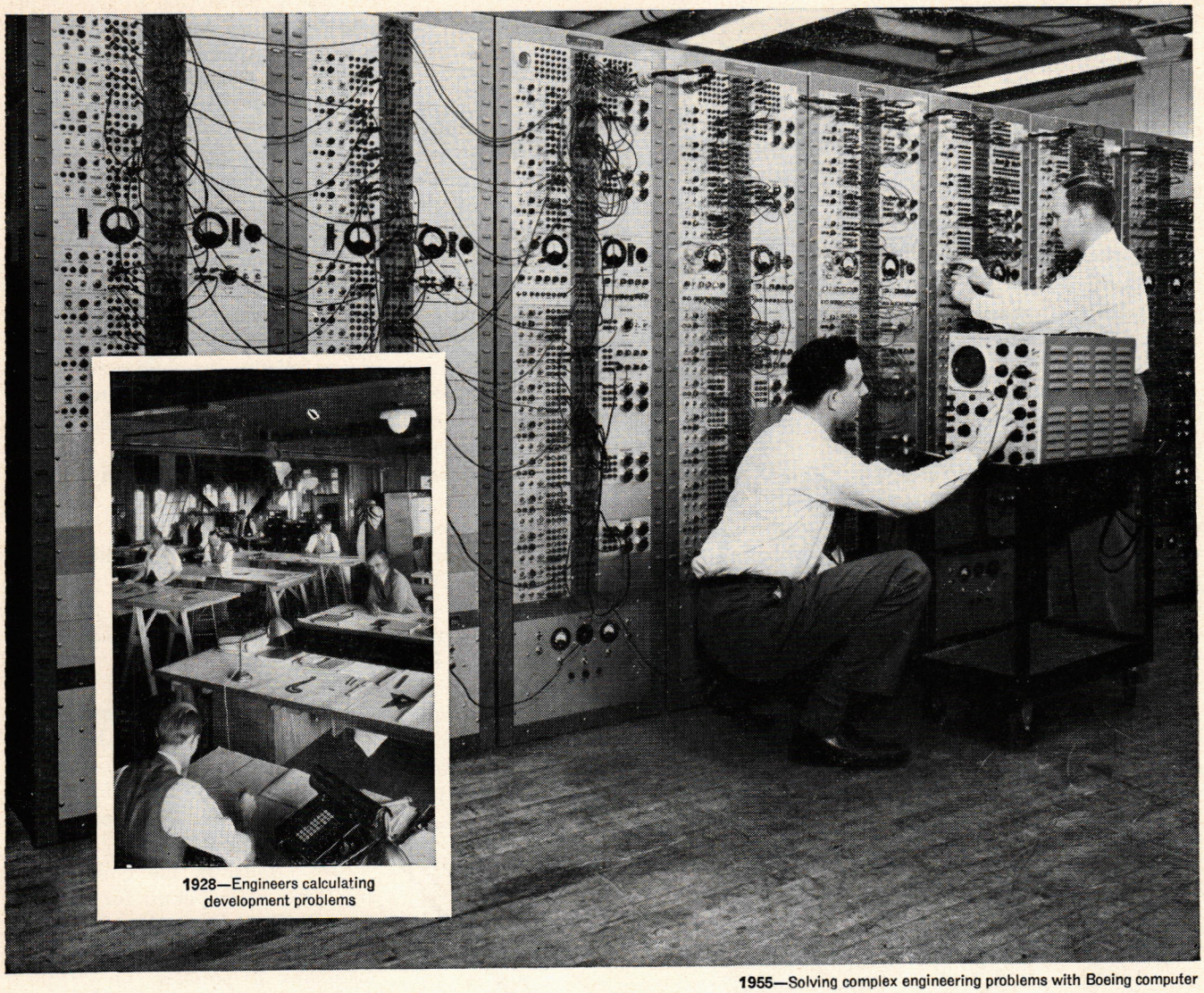
The speed of light was redetermined by the National Bureau of Standards recently. The results obtained give 299,792 plus or minus 6 km/sec and 299,795.1 plus or minus 3.1 km/sec by two different methods. This work confirms the accepted value of 299,-793 plus or minus 1 km/sec.

* * *

A light amplifier is being developed by RCA for monocrome fluoroscopy which will amplify the brightness of images twenty times. The amplifier consists of a thin screen sandwiched between two transparent electrodes and may be made in any size desired.



The effects of radio-active isotopes on bean plants are being studied by Scientists at the Hamford Atomic Products Operation facilities, Richland, Wash., operated by the General Electric Company for the Atomic Energy Commission in the picture above.



1928—Engineers calculating development problems

1955—Solving complex engineering problems with Boeing computer

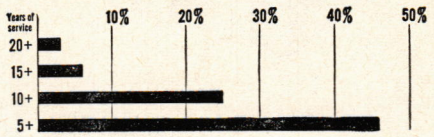
The best research facilities are behind Boeing engineers

The Boeing-designed electronic computers shown above solve in seconds problems that once required weeks—typical of the advanced "tools" that help Boeing engineers stay at the head of their field.

Boeing engineers enjoy such other advantages as the world's fastest, most versatile privately owned wind tunnel, and the new Flight Test Center—the largest installation of its kind in the country. This new Boeing Center includes the latest electronic data reduction equipment, instrumentation laboratories, and a chamber that simulates altitudes up to 100,000 feet. Structural and metallurgical research at Boeing deals with the heat and strain problems of supersonic flight. Boeing electrical and electronics laboratories are engaged in the development of automatic control systems for both manned and pilotless aircraft. Other facilities include hydraulic, mechanical, radiation, acoustics, and rocket and ramjet power laboratories.

Out of this exceptional research background engineers have developed such trend-setting aircraft as America's first jet transport, and the jet age's outstanding bombers, the B-47 and B-52. Research means growth—and career progress. Today Boeing employs more engineers than even at the peak of World War II. As the chart shows, 46% of them have been here 5 or more years; 25% for 10, and 6% for 15.

Boeing promotes from within and holds regular merit reviews to assure individual recognition. Engineers are



encouraged to take graduate studies while working and are reimbursed for all tuition expense.

There are openings at Boeing for virtually all types of engineers—electrical, civil, mechanical, aeronautical and related fields, as well as for applied physicists and mathematicians with advanced degrees.

For further Boeing career information consult your Placement Office, or write:

JOHN C. SANDERS, Staff Engineer — Personnel
Boeing Airplane Company, Seattle 14, Wash.

BOEING

SEATTLE, WASHINGTON WICHITA, KANSAS

BILLIONS OF BURIED B.T.U.'s

(Continued from page 16)

may be tripped manually at four points. Once the system is tripped, all the tanks are shut off and the propane pumps are stopped in approximately 5 seconds. These hydraulically controlled discharge valves on the tanks are arranged so that each group of 5 tanks may be operated as a unit.

During operation, the liquid propane flows from the pumps through the compressed air aftercoolers for preheating, then to the vaporizers which are heated by low-pressure steam. The vaporizers are of the vertical one-pass type with steam inside the tubes. The superheated propane vapors flow through a knockout drum equipped with a level control which will stop all propane flow in the event of excessive liquid carryover from the vaporizers.

Air for mixing with the propane vapor is supplied by the air cylinders of the gas-engine driven compressors described below.

Compressors

Four 1,200-hp. gas-engine driven compressors are used for compressing natural gas into storage and for compressing air to produce propane-air gas. Each compressor is equipped with two gas-compression cylinders and two air-compression cylinders for two-stage operation on both gas and air. At any one time a given compressor will be compressing either gas or air with two cylinders always "idling." The engines operate over a speed range of 160 to 320 r.p.m. and are complete with automatic shut-down devices which shut off the fuel supply and ground the ignition in the event of high coolant temperature, high engine speed, or low engine oil pressure. Cooling of the engine cooling water is accomplished in three fin-fan units, each equipped with a four-blade 16' diameter fan.

The 4,800 hp. of compressor capacity permits placing natural gas in storage at the rate of 36 million cu. ft. per day; thus in six hours at full rating, 9 million cu. ft. of natural gas can be delivered back into storage. This high recovery rate allows the use of the station to supplement other facilities for hourly distribution peak shaving.

Operational Controls

The design of the Rockville plant provides for the maximum in the way of automatic control, therefore the plant requires a minimum of manpower. These automatic controls in addition to providing careful regulation of operations serve with other devices to obtain a maximum of safety under varying conditions.

All principal operations for the entire plant are indicated on a graphic control board located in the control room. Among other things the board has indicators for compressor engine speeds and loading, propane tank operations, flowing quantities, pressures, and temperatures. The operator watching these indicators can quickly visualize operating conditions in the plant and can make changes in the operations as required.

Boiler House

Steam for heating buildings, jacket water, natural gas from high-pressure storage, and for vaporizing propane is supplied from four low-pressure gas-fired boilers, each rated at 17,000 lbs. per hour.

Also located in the boiler house are three water pumps for fire protection. One of these is an automatic cut-in electric-driven pump which maintains a pressure of 80 p.s.i. gauge in the hydrant system at all times.

In a room adjacent to the boiler house are located the main electrical switchboard and a 250-kw. gas-engine driven emergency generator. This generator will supply approximately one-half the requirements of the plant and will start automatically when needed during a power interruption.

Conclusion

At the expense of over a year's work and an expenditure of approximately seven million dollars, WGLC has insured an uninterrupted flow of inexpensive fuel to their customers throughout the area, and, at the same time, has provided a Maryland farmer with grazing land for his cattle.

"I needed to 'Find' Myself— that's why I picked Allis-Chalmers,"

says A. J. MESTIER

Massachusetts Institute of Technology Sc. B.—1943
and now Manager, Syracuse District Office

"I WAS LOOKING for an engineering job, but I wasn't very sure just what phase of this broad field would interest me most. I didn't know whether I wanted straight engineering, sales engineering, production or some other branch of industrial engineering.

"Allis-Chalmers Graduate Training Course gave me a means of working at various jobs—seeing what I liked best—and at the same time obtaining a tremendous amount of information about many industries in a very short time."

Experience Typical

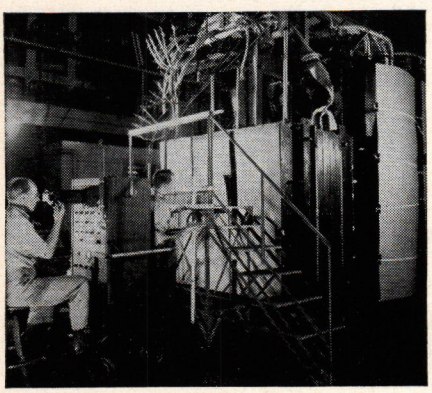
"My experience is typical in many ways. I started the Graduate Training Course in 1946, after three years in the Army. My first request was to go to the *Texrope* V-belt drive department. From there I went to the Blower and Compressor department; then the Steam Turbine department. By the time the course was completed in 1948, my mind was made up and I knew I wanted sales work. I was then assigned to the New York District Office and in 1950 was made manager of the Syracuse District. The important thing to note is that all Allis-Chalmers GTC's follow this same program of picking the departments in which they want to work.

"Best of all, students have a wide choice, for A-C builds machines for every basic industry, such as: steam and hydraulic turbine generators, transformers, pumps, motors and other equipment for electric power; rotary kilns, crushers, grinders, coolers, screens and other machinery for mining, ore processing, cement and rock processing. Then there is flour milling machinery, electronic equipment and many others."

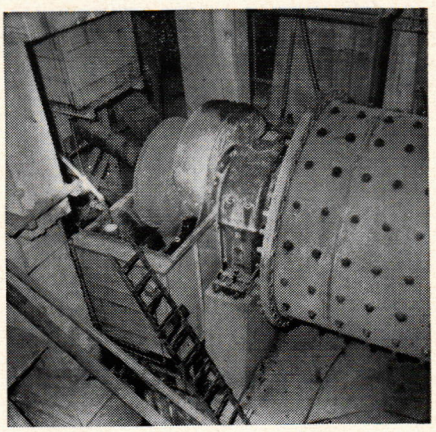
A Growing Company

"In addition, new developments and the continuing growth of the company offer almost endless opportunities for young engineers.

"From my experience on the Graduate Training Course, I believe it is one of the best conducted in the industry and permits a young engineer to become familiar with a tremendous variety of equipment—both electrical and mechanical—which will serve him in good stead in his future profession."



Taking surge voltage distribution tests on power transformer in A-C shops with miniature surge generator and cathode-ray oscilloscope.



Ball Mill grinds ore for large copper producer. Same type of equipment from Allis-Chalmers pulverizes much of nation's cement.

Texrope is an Allis-Chalmers trademark.

ALLIS-CHALMERS

For information call the Allis-Chalmers District Office in your locality or write to
Allis-Chalmers Manufacturing Company, Milwaukee 1, Wisconsin

— THANKS —

MECHELECIV would like to thank the following alumni who have subscribed since the December issue:

Henry Aaron	'28	Washington, D. C.
J. B. Allen	'49	Washington, D. C.
Murray Berdick	'42	New York, N. Y.
Richard D. Campbell	'22	Chatham, N. J.
Thomas A. Hafford	'25	Flushing, N. J.
William F. Roeser	'25	Chevy Chase, Md.
Edward V. Hobbs	'54	Takoma Park, Md.
Ralph H. Rose	'34	Arlington, Va.
James A. Sinsabaugh	'49	Arlington, Va.
Lawrence G. Walter	'32	Rockville, Md.
Henry W. Boehly	'42	Arlington, Va.
R. F. Leatherwood	'33	Chevy Chase, Md.
Frank T. Mitchell, Jr.	'40	Chevy Chase, Md.
Joel Reznek	'33	Washington, D. C.
Otis L. Turner	'32	Vienna, Va.
Nathan Abramson	'17	Silver Spring, Md.
Eugene M. Ball	'08	Eureka Springs, Ark.
Albrecht P. Barsis	'48	Boulder, Colo.
Fred H. Battle	'52	Seaford, L. I., N. Y.
James H. Beardsley	'54	New York, N. Y.
John J. Cioffi	'48	Bronx, N. Y.
Walter H. Cole, Jr.	'49	Westerville, Ohio
David C. Colony	'48	Toledo, Ohio
Col. D. L. Dutton	'13	Newark, Dela.
Wm. P. Epperson	'25	New York, N. Y.
E. J. Hand	'33	Washington, D. C.
Robert H. Harrison	'12	Chicago, Ill.
Howard W. Hodgkins	'13	Winnetka, Ill.
Lawrence K. Hyde	'25	Washington, D. C.
Joseph W. March, Jr.	'54	Washington, D. C.
Merwyn N. McKnight	'38	Arlington, Va.
Louis Richmond	'49	Silver Spring, Md.
James L. Robb	'53	Hickory, N. C.
James B. Robinson	'36	Silver Spring, Md.
Jerome B. Rockowitz	'50	Chula Vista, Calif.
Carl H. Roeder	'37	Silver Spring, Md.
George Stamback	'50	Washington, D. C.
Alan M. Staubly	'35	Minneapolis, Minn.
E. G. Sunday	'48	Riddle, Oregon
Mrs. Catherine H. Tolson	'25	Washington, D. C.

BILL GRIFFIN (BCE '49) is working as a structural designer with Edwards & Green of Camden, N. J.

WILLIAM T. ANDREWS (BEE '44, LLM '51) is now a Lt. in the USNR occupying the position of Staff Legal Officer for the Military Sea Transportation Service in New York. He is married, has 3 children, and will stay in the N. Y. area when he is released from active duty in March, '55.

E. A. BAKER (BSCE '39) is operating his own construction organization in Silver Spring, Maryland.

PERCY A. SIGLER (BSCE '25) retired last Nov. 30 after 32 years of Government service, 26 of them at the National Bureau of Standards. Mr. Sigler has been one of the country's experts on flooring research in its various phases of structure and covering. Some of the instruments which he designed have become the standards of the industry.

ALUMVIEWS

HELP!

Yes, this paper needs Help! And you, the alumni, are the only ones in a position to assist us. As pointed out on this page in the December issue, you receive the major portion of Mechelecіv's circulation, so you are the ones to whom this page is dedicated. WE NEED FACTS!—if you have a new job, your family has increased, you have retired—almost cnything is news. Remember, this page is for you, its success or failure depends on you. Even if you just want to get in touch with an old classmate, we'll print your plea.

Before you do another thing, rip, tear or cut off the form below and mail it to us as soon as possible. It's really painless, just try it!

ELMER G. SUNDAY (BME '48) and his family of four are enjoying life in a very good climate. He is the chief engineer of the Hanna Nickel Smelting Co. in Riddle, Oregon.

EUGENE M. BALL (BSME '08) retired three years ago and is enjoying life in Eureka Springs, Arkansas.

D. L. DUTTON (BS '13, CE '14) is at the same old job: operations officer, New Castle County Civil Defense Office.

FRED M. RITCHIE (BME '49) is working on an LLB degree here at GW. Fred is now a staff engineer with the Washington Gas Light Co.

TO: ALUMNI EDITOR
MECHELECIV MAGAZINE
Davis-Hodgkins' House
The George Washington University
Washington 6, D. C.

Here are a few comments for ALUMVIEW on where I'm working, what I'm doing and news of my family.

From: ---

Degree and date: ---
Check if member:

Theta Tau ____ **Sigma Tau** ____ **Other** ____

PRESIDENT'S MESSAGE

By Harry C. Connor
President, Engineers' Alumni Association

DEVELOPMENTS

One of the most important developments in the field of Engineering education was announced recently by the General Electric Company. This giant corporation has set up through its Educational Foundation a "Corporate-Alumnus Program" through which the Company will match gifts by its employees to the colleges and universities from which they graduated.

Therefore, if you are a graduate of The George Washington University and an employee of the General Electric Company, any gift you make to your alma mater —up to $1,000—will be matched by General Electric. This program opens up tremendous possibilities for corporate giving and the trend initiated by General Electric is spreading to other industries and corporations.

I am sure you will join with me in applauding this forward step taken by General Electric for the cause of higher education. I hope those men and women who have graduated from The George Washington University and who are now part of the General Electric family will be among the first to aid their alma mater through this program.

RECENT PLANS

A meeting of the officers of the Engineers' Alumni Association on Tuesday, Feb. 15 brought to light two new ideas: an Alumni luncheon and a recent graduate luncheon series. The Alumni Luncheon is proposed for April with all engineering alumni of the University invited. The luncheon series for graduates from 1948 on is tentatively planned for this spring. Your MECHELECIV will keep you posted on further developments.

LAWRENCE G. WALTER (BSEE '32) Retired from the Army Corps of Engineers in July of '52.

JOHN E. LECRAW (BS Eng. 40) has been employed for the past 9 years by the Mosstype Corp. in Brooklyn, N. Y. John is the proud father of a boy of 10 and a girl of 8.

JAMES A. SINSABAUGH (BME '49) has recently been appointed treasurer of the Washington section of the ASME.

— DIED —

WALTER JOHANNESSEN (BSCE '16) one of Arizona's leading builders died last November in Phoenix, Arizona. He left many works in Arizona which stand as monuments to his engineering ability. Although his company of Johannessen & Girand is located in Phoenix, he worked on a great many of the major developments in other Arizona cities as well.

ODK . . . FOR YOU?

(Continued from page 6)

and one position evaluated at a minimum of five points.
c. Two positions evaluated at a minimum of 10 points each.

5. Not more than 30 points may be accrued in any one general field of activity.

Section 2 — Basic Point Schedule
Field I—Scholarship.

1. a. Fifteen points will be awarded for completing 90 semester hours with a quality point index of 3.0 or better.
   b. Ten points will be awarded for completing 75 semester hours with a quality point index of 2.60 or better.
2. Five points will be awarded for membership in Sigma Tau.
3. Receipt of any points in this field is conditional upon the candidate holding at least 10-point position in one of the other fields of activity.

Field II—Student Government, Religious, and Social Activities

1. Student Council
   a. President 20
   b. Other members (elected 12
   School representatives 7
2. Colonial Boosters
   a. President 15
   b. Other legislative officers 10
3. Interfraternity Council
   a. President 12
   b. Social Chairman 10
   c. Other elected officers 5
5. Engineers' Council
   a. President 10
   b. Other members 7
8. Social Fraternities
   a. President 8
   b. Other elected officers 4
9. Professional organizations, social organizations other than fraternities, honorary organizations, and service organizations.
   a. President 5
   b. Other elected officers 3

Field III—Athletics

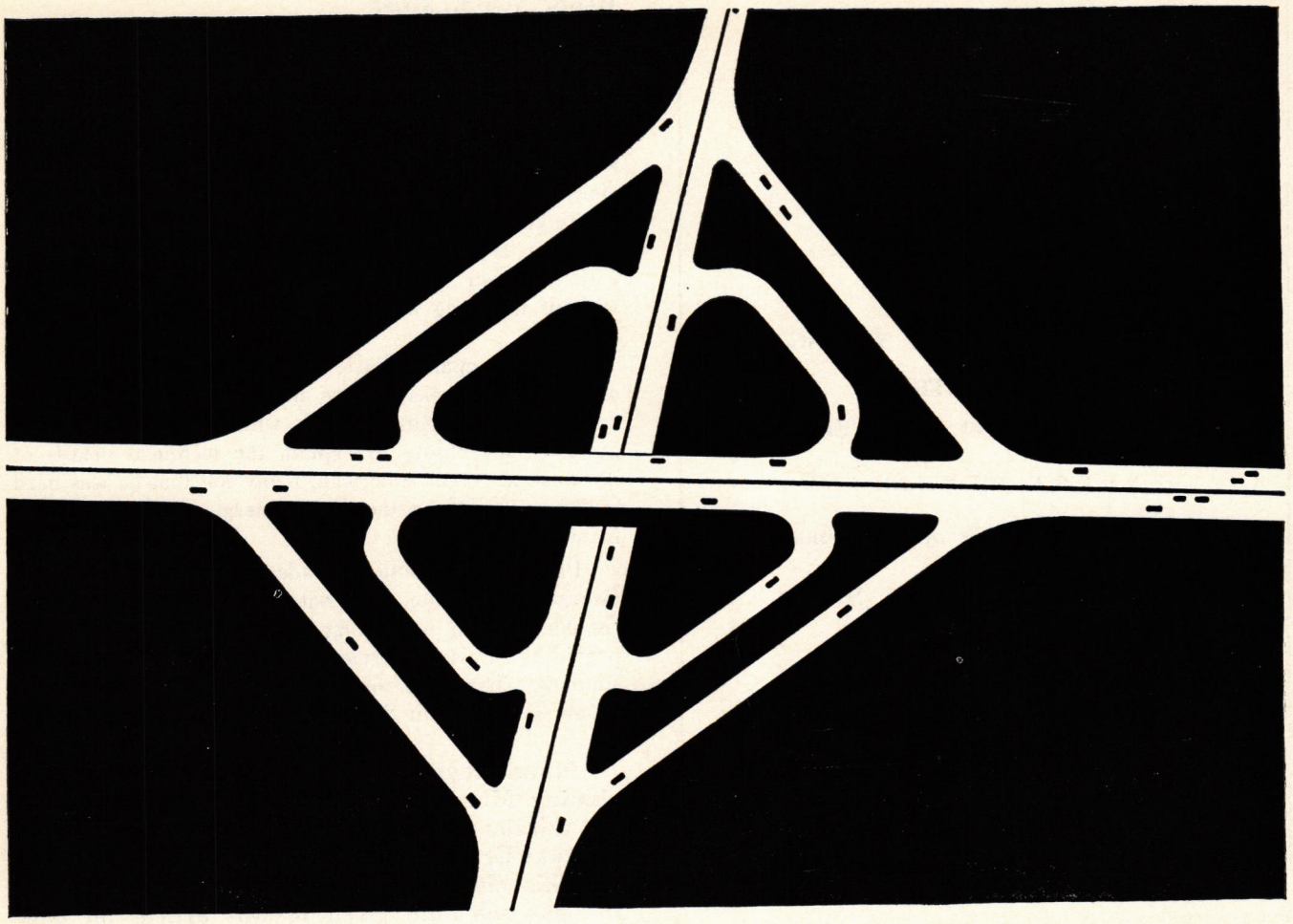
3. Intramural Sports—three men each year, to be recommended for the spring tapping by the Intramural Board on the basis of intramural participation 10

Field IV—Publications

1. Hatchet.
   a. Board of Editors 20
   b. Sub-editorial board 10
   c. Staff. 5
2. Cherry Tree
   a. Editor-in-chief 20
   b. Board of editors, associate editors, business manager, managing editor 15
   c. Sub-editorial Board 10
   d. Staff members 5
3. Mecheleciv
   a. Editor 17
   b. Associate editor, business manager 12
   c. Staff members 5

Field V—Dramatics, Forensics, and Musical

All points in this field are assigned by faculty advsiors on the basis of participation and interest. Maximum per organization is 20 points.
(Note: All ten point positions and above are evaluated by the faculty advisor of the organization as to the student's interest and performance. On the basis of this evaluation the activity points are multiplied by a factor ranging between 0.0 to 1.25).



FROM COW-PATHS TO CLOVERLEAFS...

The narrow, twisting, rut-ridden roads of yesteryear are being replaced by new multi-lane, high-speed highways. Crossroads have been bridged and cloverleafed . . . hills have been leveled . . . curves lengthened.

These changes have happened in the half century since the advent of the automobile. For more and better cars and trucks demand faster, safer roads and turnpikes.

SPACE FOR SPEED...

The traffic that flows over America's three-million mile network of roads represents the very life stream of our progress. Nowhere else in the world do people travel so far and so freely . . . nor do so many trucks deliver such a wide and plentiful supply of merchandise so fast and to so many places.

AMERICA WORKS LIKE THAT...

Here in America we have men who dare to dream and build for future needs . . . machines to move mountains . . . materials to make roads . . . and an all-seeing, all-hearing, and reporting Inter-Communications System that acquaints every branch of science and engineering . . . every technical skill . . . with the needs and the accomplishments of every other field of endeavor.

THE AMERICAN INTER-COM SYSTEM...

Complete communication is the function, the unique contribution of the American business press . . . a great group of specially edited magazines devoted to the specialized work areas of men who want to manage better, research better, sell better, buy better.

COMMUNICATION IS OUR BUSINESS...

Many of the textbooks in which you are now studying the fundamentals of your specialty bear the McGraw-Hill imprint. For McGraw-Hill is the world's largest publisher of scientific and technical works.

After you leave school, you will want to keep abreast of developments in your chosen profession. Then one of McGraw-Hill's many business magazines will provide current information that will help you in your job.

McGRAW-HILL
PUBLISHING COMPANY, INC.

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NEW YORK 36, N. Y.

McGRAW-HILL FOR BUSINESS

HEADQUARTERS FOR TECHNICAL AND BUSINESS INFORMATION

JOBS, JOBS, JOBS

(Continued from page 12)

The type of interview has varied widely. Some companies use only one interviewer while others use two or more with the extra help being passed off as a new interviewer in training. Normally the student is expected to fill out an employment application before the interview. Unfortunately only a few companies, such as Westinghouse, have been thoughtful enough to design a screening type application that provides the interviewer with adequate information to conduct the interview without imposing unnecessary work on the part of the student.

A few companies have experimented with the idea of sending an engineer to hire an engineer. North American tried this approach and, while some students appreciated his ability to explain the technical details of the work at North American, many felt that he was hard to converse with on the more general details of employment.

Patricia F. Coulter, Student Placement Office of George Washington University, has played a large and capable role in organizing the interview schedule and providing liaison service between interviewers and students. The engineering student particularly owes her a vote of thanks for this year's service.

MECHELECIV has just received word that beginning March 12 all government-offered starting salaries for engineering graduates will be as follows: Grade 5—$4,035, Grade 7—$4,580.

This change offers some improvement over the pay schedule given in this article on page 12 which was printed before the change was authorized

TV SET — HAVE YOU SEEN IT?

Something new has arrived at the Davis-Hodgkins House. A television set has been added to the lounge. The set is an expression of friendship from Mrs. Charles Hybarger, Buzzard Point Boat Yard, First and V Streets, S.W. This gift has certainly been appreciated by the students.

IN OUR NEXT ISSUE

GUERDON TRUEBLOOD, ***an EE Freshman, has invented a "wonderful variable resonance bathroom," which will prove to be a boon to bath tub baritones. Full details will appear in April.***

* * *

YOUR CANDIDATES ***for the Spring General Election for the Engineers' Council will present their platforms (or anything else they have to stand on) in the next issue.***

Richmond Station of the Philadelphia Electric Co.

Weeks of work shrink to days as

photography weighs mountains of coal

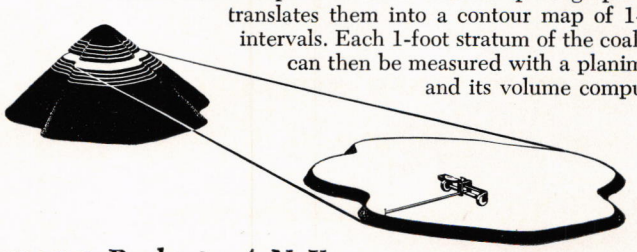
Aero Service Corporation takes stereo pictures of the coal piles at a utility's 10 storage sites—reports the fuel reserves on a single inventory date at 25% lower cost than with other methods

It used to take a surveying crew weeks to measure and figure the contents of the Philadelphia Electric Co.'s big coal piles. Now a camera and an airplane work together to cut the time to days. Overlapping pictures are taken from the air. Then with stereo plotting equipment the volume of the heap is calculated.

Streamlining the inventory job is a natural for photography. It's being used to count metal rods, automotive parts, telephone calls as well as tons of coal. But photography works for business in many other ways as well —saving time, reducing error, cutting costs, improving production.

Graduates in the physical sciences and in engineering find photography an increasingly valuable tool in their new occupations. Its expanding use has also created many challenging opportunities at Kodak, especially in the development of large-scale chemical processes and the design of complex precision mechanical-electronic equipment. Whether you are a recent graduate or a qualified returning service man, if you are interested in these opportunities, write to Business & Technical Personnel Dept., Eastman Kodak Company, Rochester 4, N. Y.

Aero Service Corporation takes its stereo photographs and translates them into a contour map of 1-foot intervals. Each 1-foot stratum of the coal pile can then be measured with a planimeter and its volume computed.



Eastman Kodak Company, Rochester 4, N. Y.

What will you add to jet engine progress?

New, dramatic advances being made at General Electric's aircraft gas turbine operations bring into clear focus the vital role recent college engineering graduates play throughout the company. Typifying such responsibility are R. W. Bradshaw, ME, Lehigh, '48, responsible for design of development engine controls and accessories, and B. C. Hope, EE, UCLA, '49, supervisor of test programs for development of aerodynamic and mechanical components.

In every field from electrical, mechanical, metallurgical and aeronautical engineering to physics and chemistry, young men like these broaden their technical background in GE's after-college program of practical engineering assignments. In this program, as in his ultimate career, the engineer chooses the field and location—from the entire range of G-E activities including plastics, large electrical apparatus, electronics, jet propulsion, automation components and atomic power.

Working with world-renowned G-E engineers, you—like Bradshaw and Hope—can make important contributions early in your engineering career. For full details on the G-E career suited to your talents and interests, see your college placement director, or write General Electric Company, Engineering Personnel Section, Schenectady 5, New York. TR-1A

Progress Is Our Most Important Product

GENERAL ELECTRIC